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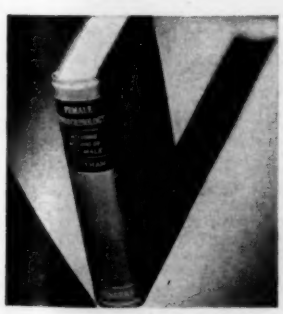
New—Hoffman's Female Endocrinology



Including Sections on the Male—Among the most significant features of the entire book are the full evaluation of treatment and the tabular information on hormone preparations, including sources, biologic effects, standardization, route of administration, name and manufacturer and indications for use and dosage.

Furthermore, Dr. Hoffman has placed particular emphasis on *the importance and place of non-endocrine therapy,* an approach enthusiastically endorsed by foremost authorities in this field.

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By JACOB HOFFMAN, M.D., Demonstrator in Gynecology, Jefferson Medical College, and Pathologist in Gynecology, Jefferson Hospital. Foreword by BROOKE M. ANSPACH, M.D., Emeritus Professor of Gynecology, Jefferson Medical College 788 pages, 6½" x 9½", illustrated. $10.00.

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AN ARSENICAL WITH A BRILLIANT RECORD OF EFFECTIVENESS AND SAFETY
MAPHARSEN
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TSUTSUGAMUSHI FEVER IN THE SOUTHWEST PACIFIC THEATER

MAJOR CHARLES E. AHLM
MEDICAL CORPS, ARMY OF THE UNITED STATES
AND
CAPTAIN JACK LIPSHUTZ
MEDICAL CORPS, ARMY OF THE UNITED STATES

This study comprises some 70 cases of tsutsugamushi fever. Most of the patients resided for a period of weeks to several months in an area which has proved endemic for the disease. This paper represents our observations and the experimentation and study possible with limited equipment while working under field conditions. Should this information serve to stimulate further laboratory experimentation and give the profession a better conception of the military and economic importance of this disease, we would feel our efforts well spent.

Until recently the condition about to be considered has not been given the space it deserves in American medical textbooks, owing in part to our lack of interest from the economic standpoint in many of the tropical and subtropical countries. The advent of World War II has, however, changed the picture entirely. We now find not only the men of allied armed forces but our own men suffering the ravages of this fever in many tropical areas. The total man days lost from this disease have presented a problem. This, together with the great advance in air transportation expected in the postwar period, tends to make the disease one of considerable military and economic importance.

Tsutsugamushi fever is to us a suitable name for the disease here described. Tsutsugamushi has been associated with this particular type of fever in Japan since 1899. The name means "dangerous bug fever," which, although it gives no indication of its relation to the typhus group of fevers, is entirely adequate. A comparison of tsutsugamushi fever in Japan with rickettsial fevers as reported from Sumatra, Malaya, New Guinea and other territories under names such as Sumatran fever, K typhus, scrub typhus and Kedani disease shows a high degree of similarity. Although it has not yet definitely been proved, these diseases appear to be identical. Minor differences might be explained on the basis of the change in virulence of the organism in different localities.

For reasons of military security, we are unable, at the time of this writing, to state our exact location in the tropics.

EPIDEMIOLOGY

Sambon [1] stated that the association between mites and disease has been known for over a thousand years. Tanaka [2] attributed the "river fever of Japan" to a minute red mite locally called Kedani mite.

There is reasonable evidence to indicate that the cases as reported from Formosa, Korea, Sumatra, India, Malaya, New Guinea and more recently North Queensland, Australia, are probably the same tsutsugamushi fever originally described as occurring in Japan. The pseudo-typhoid as reported by Schüffner [3] we believe to be a mild form of tsutsugamushi fever. A low death rate, lymphocytosis and general distribution of rash are not sufficient differential points. The virulence of the micro-organism unquestionably varies in different localities and probably accounts for Schüffner's findings.

The endemic nature of this disease is well known. The majority of our cases occurred in an area of about ½ square mile at an elevation 100 feet above sea level. The annual rainfall has varied from 100 to 120 inches, the highest level occurring during the months of December, January, February and March. It is terrain which is a favorable habitat for rodents; the condition of the ground and type of vegetation are ideal for the larval mite.

Our patients for the most part gave histories of having been in wooded sections, logging or clearing areas where the vegetation is dense. In the process, many contracted the disease. This type of history is quite typical and coincides with the observations of Heaslip [4] as described in his report from the West Cairns area of North Queensland.

Sufficient time has not yet elapsed to evaluate fully the seasonal factor. It is doubtful, however, that the season will be of any consequence in this particular territory.

The characteristic regional habitat is the scrub along the small streams and areas of dense damp jungle. We also found mites to be prevalent near the sago palm

Major Ahlm was formerly instructor, MRTC, Camp Grant, and at present is flight surgeon with a unit of the AAF.

Captain Lipshutz of the staff of Jewish Hospital, Philadelphia, on leave of absence, is at present assigned to the medical service of a station hospital.

Major Charles L. Garcia, commanding the station hospital, permitted us to review the clinical records in these cases. Capt. R. N. McCullock of the Third Australian Mobilization Entomological Section gave suggestions and assisted in identifying several specimens of acarnia. Drs. K. F. Maxcy and F. G. Blake of the American Typhus Commission gave constructive criticism and suggestions. Professors Harvey Sutton and J. W. Fielding of the School of Tropical Medicine, University of Sydney, collected and forwarded Dr. Gunther's papers. Major Markle donated the photographic illustrations. S/Sgt. Norman W. Ibbotson and T/5 Max Davis, Medical Department, U. S. Army, gave much of their free time to typing the manuscript.

1. Sambon, L. W.: Parasitic Acarians of Animals and Part They Play in Causation of Eruptive Fevers and Other Diseases of Man: Preliminary Considerations Based on Ecological Study of Typhus Fever, Ann. Trop. Med. **22**: 67-132, 1928.
2. Tanaka, K.: Remarks on the Etiology of the Kedani Disease, Centralbl. f. Bakt. (Abt. 1) **26**: 432-439, 1899.
3. Schüffner, W.: Pseudotyphoid Fever in Deli, Sumatra (A Variety of Japanese Kedani Fever), Phillippine J. Sc. (Sect. B) **10**: 345-353, 1915.
4. Heaslip, W. G.: Tsutsugamushi Fever in North Queensland, Australia, M. J. Australia **1**: 380-392, 1941.

swamps margined by kunai grass. Where the kunai grass grew tall in natural clearings adjacent to the jungle, only occasional mites could be found.

ETIOLOGY

A number of early investigators proved the rickettsial nature of this disease, although the specific rickettsia producing tsutsugamushi fever is a matter in which

Fig. 1.—Regional lymphadenopathy.

there is some difference of opinion. It is possible here only to state briefly the findings of a few early investigators.

Hayashi [5] was first to call the organism causing tsutsugamushi fever in Japan the Rickettsia tsutsugamushi. Kawamura and Imagawa [6] identified the organism as Rickettsia akamushi. Sellaris [7] proposed the name Rickettsia nipponica for it. Ogata [8] confirmed the findings of Hayashi, naming Rickettsia tsutsugamushi as the etiologic agent. Reasonable proof exists that these organisms are identical. Lewthwaite and Savoor [9] by means of elaborate and exhaustive cross immunity experiments showed the similarity between scrub typhus and Japanese river fever both by intraocular and by intradermal reactions in rabbits and monkeys. In cross protection tests between the organisms of Sumatran fever and the tsutsugamushi of British Malaya performed on rabbits and monkeys it was the conclusion that these are also identical diseases.

The difficulty of demonstrating rickettsias in human tissue sections is common knowledge, and to date we have been unable to do so. In the future, if the laboratory is able to demonstrate rickettsias in the tissues of cases which come to autopsy, the morphologic characteristics should coincide in a general way with the description as reported by Hayashi.

Hayashi's description will serve to exemplify the typical rickettsial micro-organism producing the disease. He reported a minute rod or spheroid body demonstrable in the cytoplasm of lymphocytes and endothelial phagocytes of the tissues of the local lesion, lymph modes and spleen, using Giemsa's stain. This he classified as Theileria, but it has since been classified with the genus Rickettsia (R. tsutsugamushi).

Dr. Fielding [10] has kindly consented to attempt the demonstration of rickettsias in some of our arthropod specimens, using his Modified Breinl method. At a later date we hope to report the results of this experiment.

THE VECTOR

The larval form of the mite genus Trombicula is to date the only mite known to be definitely associated with tsutsugamushi fever. Several species of Trombicula, and even variants of one species, may be vectors in different localities.

The eggs of the genus Trombicula are laid in clusters in the soil several inches below the surface. Here the ova hatch, later passing through the various developmental stages to the adult form. The larvae are small, microscopic, six legged creatures which move about on the ground or herbage until able to attach themselves to a passing host. Rodents, marsupials, birds, bush fowl, lizards or man may provide the blood meal for these larval mites. The nymph and adult probably feed on vegetation, but little is known of their habits.

The rickettsial infection transmitted by the larval mite is apparently inherited from the parent, the larvae not feeding a second time.

Trombicula akamushi was found to be the vector of this disease in Japan. Walch and Keukenschrijver [11] reported Trombicula deliensis to be the vector in the Dutch East Indies, and Gunther,[12] working in New Guinea, named what he thought at that time was a local variant of Trombicula deliensis and called it Trombicula vanderghinstei. It is highly probable that T. akamushi and T. deliensis are at most variants of the same species.

We have collected specimens of Trombicula and Guntherana and occasional ticks about the ears and genitalia of field rats and mice killed in this locality. Other specimens, including Trombicula minor and Trombicula fletcheri, were obtained by standing in a selected area of tall grass or vegetation where the mites would readily crawl on the footgear, being easily removed with the aid of a small camel hair brush. Specimens were placed

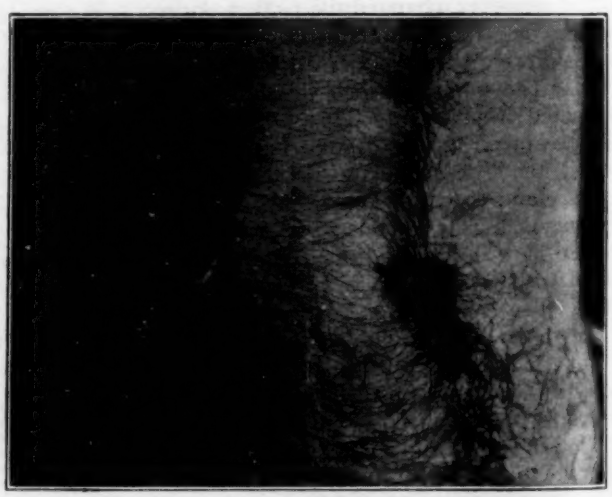

Fig. 2.—Primary lesion.

in 70 per cent alcohol temporarily, then mounted on slides for identification. All the specimens we have seen were prepared by the use of Berlese's modified

5. Hayashi, N.: Etiology of Tsutsugamushi Disease, J. Parasitol. **7**: 53, 1920.
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10. Fielding, J. W., School of Tropical Medicine, University of Sydney: Personal communications to the authors.
11. Walch, E. W., and Keukenschrijver, N. C.: Ueber die Epidemiologie des Pseudotyphus von Deli, Arch. f. Schiffs- u. Tropen-Hyg. (supp. 1) **29**: 420-428, 1925.
12. Gunther, C. E. M.: Trombidiid Larvae in New Guinea (Acarnia; Trombidiidae), Proc. Linnean Soc. New South Wales, 1939, vol. 64; The Association Between the Larva Described as Trombicula Hirsti var. Buloloensis Gunther 1939 and Trombicula Minor Berlese 1904 (Acarnia: Trombidiidae), ibid., 1939, vol. 64.

medium.[13] Capt. R. N. McCullock mounted and identified some of our specimens; several were also sent to a laboratory of microbiology and pathology.

Specimens of Trombicula are numerous in this area; but the determination of the specific species or variants is extremely difficult, since so many species have already been classified. Until we have completed further laboratory work it is impossible for us to state with accuracy the specific species of Trombicula responsible for the fever in this area. We are highly suspicious at this time of three species: T. minor, T. deliensis and T. fletcheri, or perhaps even variants of these species may be responsible for our series of cases. Although ticks (Dermacentor andersoni, Dermacentor variabilis, Rhipicephalus sanguineus) transit other rickettsial diseases, none have as yet been proved vectors for Rickettsia tsutsugamushi. The possibility, however, must be considered as new varieties are found and classified.

Trombicula larvae attack regions of the body about the waistline, the scrotum, groin and armpits. It appears to be where the degree of moisture is favorable. The pressure of the clothing is important only because it would tend to increase the moisture of the skin where pressure exists.

In areas a considerable distance from our camp site we have found many mites of genus Schongastia and Neoschongastia. These are apparently the cause of the common tropical ailment known as scrub itch.

THE RESERVOIR

A previous worker reported natural infection in rats and bandicoots. A series of titers were accomplished on blood from rats trapped in the North Queensland area of Australia. He extracted blood by intracardial puncture, testing by OXK and OX19 agglutination with positive titers (OXK) and in a high percentage of the rodents. We are endeavoring at present to confirm his findings using specimens collected here and will report our findings in a subsequent paper.

Ectoparasites have been removed from the ears and about the genitalia of rats trapped in our area, as previously stated. Many of these were specimens of Trombicula, the species of which were quite varied. Several specimens of Guntherana were also removed from the rodents. It is our opinion that the field rat is the principal reservoir in this region, the others being of lesser importance.

Gunther lists some seventeen hosts of the larval mite, including the bush fowl, swamp hen, parrot, rat, bandicoot and wild pig. We cannot agree with Gunther in excluding lizards as hosts of the larval mites, since we found numerous larval mites attached to lizards in this vicinity. We were not able to identify the occasional ticks recovered.

CLINICAL REPORT

The most common location of the primary lesion of this disease is the scrotal area, though the inguinal and ankle areas are frequently involved. After an incubation period of seven to fourteen days, the patient complains of headache (frontal), generalized aches and pains, backache, weakness, insomnia, chilliness and fever. A small number complain of pain in the abdomen, with associated nausea and vomiting and occasionally diarrhea. The ulcer varies in size from a few millimeters to 1 centimeter in diameter. Characteristically, a central black necrotic area develops, surrounded by an indurated red areola. Rarely a lymphangitis can be observed tracing its way to the local lymphadenitis. These glands are usually enlarged to the size of a walnut, smooth, tender and not attached to the adjacent

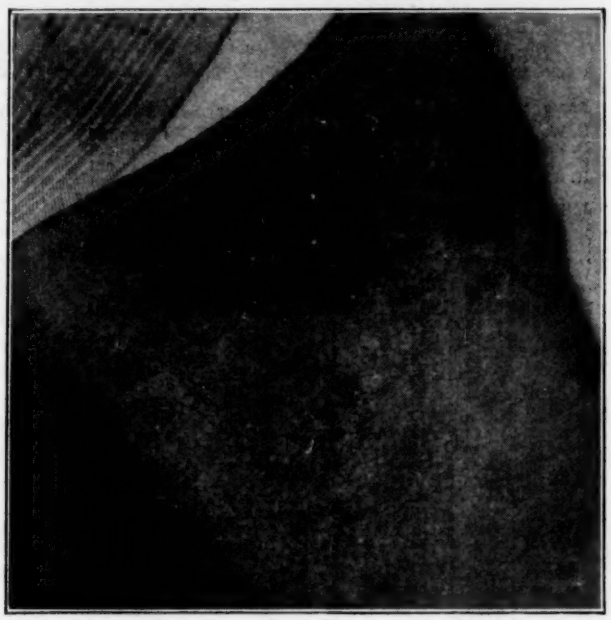

Fig. 3.—Primary lesion.

glands or tissues. They do not suppurate. Few cases show a generalized lymphadenitis. The adenitis appears from three to four days after the onset of symptoms. The temperature rises slowly, reaching a peak of 104 or 105 F. within ten days. The pulse is slow in proportion to the temperature rise. A conjunctivitis with mild edema of the eyelids is present. A dusky flush is seen in many instances on the face and neck. As the disease progresses the patient becomes weaker and a generalized myotonia becomes more pronounced. About the fourth day after the appearance of the adenopathy a macular erythematous patchy rash can be observed over the face, chest and abdomen, many of the described areas having a pale raspberry-like appearance. At the height of the disease about 67 per cent of the patients show severe atypical pneumonic signs, with a dry cough and scanty expectoration, and complain of dyspnea and tightness over the sternum. In a few cases there is evidence of consolidation. X-ray examination of about 20 per cent of these cases showed an atypical virus-like pneumonia. Epistaxis was also found in about 20 per cent of our cases and came on at the height of the rise of temperature. Conjunctival hemorrhage has been present in a few cases. Abdominal distention with nausea and vomiting was present in about 60 per cent of our cases and made treatment a difficult problem. About 34 per cent of our cases showed auditory disturbances from mild diminution of hearing to almost complete deafness. Cerebral typhoidal signs are present in many cases, with hallucination, disorientation, insomnia and nervousness being the outstanding features. The elevated temperature continues for ten to fourteen days, during which time the patient is extremely weak and perspires profusely. Myocardial damage has been observed late in the disease, in 3 cases manifested by

13. Modification of Berlese's medium used for the mounting of Acarina:

Distilled water	100 cc.
Chloral hydrate	50 Gm.
Gum arabic	40 Gm.
Phenol	50 Gm.
Glucose syrup	10 Gm.
Glacial acetic acid	20 cc.

gallop rhythm, reduplication of the mitral first sound and muffled apical sounds. These are poor prognostic signs and were present in the one death that occurred. The rash usually disappears in from three to five days. The temperature falls by lysis, and convalescence is agglutination. Many patients with a high titer are mildly ill. We have found that nearly all patients with a low titer showed no primary ulcer. Whether this is due to a different or to a weaker strain of Rickettsia remains to be proved.

Signs and Symptoms of Tsutsugamushi Fever with the Eventual Outcome in a Series of Seventy Cases

Name	Headache, Chilliness, Weakness, General Aches	Admission Average Temp. and Pulse Rate: Temperature	Admission Average Temp. and Pulse Rate: Pulse	Ulcer	Adenopathy	Rash	Pneumonic Signs	Diminished Hearing	Epistaxis	Abdominal Distention	Agglutination Titer of OXK	White Blood Cells	Recovered	Death
R. W.	5 days	101	82	.....	Inguinal	++	+	—	—	+	1:80	14,250	+	—
D. G.	4 days	103	88	Scrotum	Inguinal	++	+	—	—	—	N. D.	5,200	+	—
C. E.	4 days	102.8	94	Thigh	Inguinal	++	+	—	—	—	1:320	2,900	+	—
H. K.	7 days	102.8	90	.....	Inguinal and axillary	++	+	+++	+	+	1:40	6,000	+	—
J. S.	2 days	102.4	70	.....	Inguinal	++	—	—	—	+	1:160	6,400	+	—
N. H.	2 days	102	80	.....	Inguinal	++	+	—	—	—	Negative	9,200	+	—
G. E.	2 days	103.2	80	.....	Inguinal	++	+	—	—	+	N. D.	6,400	+	—
E. S.	7 days	102	100	.....	Inguinal	+	+	—	—	—	1:40	7,200	+	—
W. B.	1 day	103.2	88	.....	.....	+	+	+	+	—	1:80	5,200	+	—
C. M.	5 days	102	90	.....	.....	++	+	+	—	+	1:80	5,200	+	—
H. B.	3 days	101.4	88	Thigh	Inguinal	++	+	—	—	+	1:80	4,850	+	—
R. H.	2 days	103.8	86	.....	+	++	—	—	+	—	1:80	10,000	+	—
R. F.	2 days	102	78	Ankle	Inguinal	++	—	—	—	+	1:640	7,200	+	—
B. K.	3 days	101	80	Ankle	General	++	—	—	—	+	1:640	5,450	+	—
J. B.	2 days	102	88	Thigh	Inguinal and axillary	++	—	—	—	—	N. D.	5,950	+	—
F. G.	2 days	103.2	88	.....	Inguinal	—	—	—	—	+	1:160	No data	+	—
J. B.	2 days	102.4	96	Ankle	Inguinal	++	—	—	—	+	1:640	No data	+	—
E. B.	5 days	102.4	96	Scrotum	Inguinal	+	+	—	—	—	1:640	No data	+	—
J. M.	3 days	102	96	Scrotum	Inguinal	++	—	—	—	—	N. D.	6,400	+	—
I. B.	3 days	101.2	78	Scrotum	Inguinal	++	+	—	—	—	1:320	7,200	+	—
W. S.	2 days	102.2	78	Thigh	Inguinal	++	+	—	+	+	1:320	No data	+	—
S. G.	1 day	102.6	96	Scrotum	Inguinal	++	—	—	—	+	1:320	No data	+	—
J. T.	1 day	100.8	80	Ankle	Inguinal	++	—	—	—	—	N. D.	6,400	+	—
R. W.	1 day	103	100	Scrotum	Inguinal	++	+	—	—	+	1:640	9,900	+	—
F. C.	1 day	102.2	96	Inguinal	Inguinal	++	+	—	•	+	1:1280	6,400	+	—
W. L.	1 day	102	88	Inguinal	Inguinal	—	—	—	—	—	1:640	No data	+	—
J. K.	4 days	103.8	80	Scrotum	Inguinal	++	+	—	+	—	1:640	4,750	+	—
A. P.	3 days	101	88	Inguinal	Inguinal	++	+	—	—	+	1:640	No data	+	—
L. B.	2 days	101.2	76	Inguinal	Inguinal	+	+	—	—	+	N. D.	No data	+	—
W. F.	2 days	102.4	88	Scrotum	Inguinal	++	++	—	+	+	1:40	6,400	+	—
E. B.	5 days	100.2	80	Ankle	Inguinal	++	+	+	+	+++	1:160	7,200	+	—
L. F.	3 days	102.4	88	Ankle	Inguinal	++	+	—	+	+	1:320	5,950	+	—
M. V.	1 day	101.4	80	.....	Inguinal	++	+	—	—	—	1:160	No data	+	—
I. B.	1 day	102	90	.....	General	++	+	+	—	+	1:1640	7,200	+	—
A. E.	4 days	101.4	80	Scrotum	Inguinal	++	—	—	—	+	1:1280	8,400	+	—
A. C.	3 days	102.4	80	.....	Inguinal	++	—	+	—	+	1:80	No data	+	—
A. G.	2 days	102.8	88	.....	.....	—	—	+	+	—	1:80	8,400	+	—
E. S.	2 days	100.4	88	Inguinal	Inguinal	++	+	+	—	—	1:160	4,500	+	—
W. S.	1 day	101	88	.....	Inguinal	—	—	+	—	—	1:1640	No data	+	—
G. N.	3 days	101	84	.....	Inguinal	++	—	—	—	—	N. D.	No data	+	—
F. V.	1 day	102.6	96	Scrotum	Inguinal	++	+	—	—	—	N. D.	No data	+	—
R. Mc.	3 days	100.4	96	Inguinal	Inguinal	—	—	—	—	—	1:640	No data	+	—
A. H.	2 days	101.2	80	Scrotum	Inguinal	++	—	+	—	—	1:160	6,700	+	—
G. B.	2 days	102	86	Scrotum	Inguinal	++	+	+	+	+	Negative	7,200	+	—
C. A.	1 day	100.4	84	Inguinal	Inguinal	++	+	—	—	+	1:640	No data	+	—
E. M.	2 days	101	88	Scrotum	General	++	+	+	+	+	1:80	2,800	+	—
J. S.	2 days	102.2	84	Scrotum	Inguinal	++	+	—	—	++	1:80	7,700	+	—
H. F.	7 days	102.6	88	Ankle	Inguinal	++	+	—	—	—	1:640	7,900	+	—
J. P.	3 days	103	96	.....	Inguinal	+	+	—	—	—	1:160	No data	+	—
P. L.	4 days	101.2	88	Ankle	Inguinal	++	—	—	—	—	1:640	No data	+	—
I. F.	3 days	103.2	96	Popliteal space	Inguinal	++	+	—	—	—	1:640	5,900	+	—
C. B.	2 days	102.4	100	Popliteal space	Inguinal	++	+	+	—	—	N. D.	8,400	—	+
J. B.	4 days	100.2	76	Popliteal space	Inguinal	++	—	—	—	—	1:320	No data	+	—
J. H.	1 day	103	76	.....	Inguinal	++	—	—	—	—	1:160	No data	+	—
R. R.	2 days	102.8	96	Inguinal	Inguinal	++	+	+	—	—	1:640	No data	+	—
M. N.	1 day	103	88	.....	.....	++	+	+	—	—	1:320	No data	+	—
F. R.	2 days	102	86	Inguinal	Inguinal	++	+	+	+	+	.....	No data	+	—
S. C.	5 days	101.6	96	.....	General	++	+	+	—	—	Negative	7,200	+	—
F. A.	3 days	103.4	96	Ankle	Inguinal	++	+	+	—	—	1:640	No data	+	—
J. D.	5 days	102	96	Thigh	Inguinal	++	+	+	—	—	1:640	4,850	+	—
M. C.	5 days	103.4	96	Ankle	Inguinal	++	+	+	—	+	1:40	6,750	+	—
A. P.	3 days	102.2	88	Thigh	Inguinal	++	+	+	+	+	Negative	1,400	+	—
R. D.	3 days	102.6	96	.....	General	++	—	—	—	—	Negative	8,400	+	—
A. H.	2 days	102	96	Thigh	Inguinal	++	+	+	+	+				
C. T.	3 days	102.6	96	Popliteal space	Inguinal	++	+	+	—	+				
E. G.	2 days	103.6	100	.....	Inguinal	++	+	+	—	—	....	No data	+	—
G. K.	1 day	103.4	86	Thigh	Inguinal	++	+	—	—	—	1:80	5,900	+	—
F. M.	3 days	102.4	86	.....	Inguinal	—	—	—	—	—	1:160	No data	+	—
J. A.	2 days	103.2	94	Scrotum	Inguinal	++	+	—	—	—	1:40	6,700	+	—
M. P.	2 days	102.6	96	Scrotum	Inguinal	++	+	—	—	—	1:80	8,400	+	—

long. It has been our experience that the white blood cell count is of little diagnostic value, though more than a few cases show a leukopenia with a relative lymphocytosis. The specific agglutination test OXK is negative early in the disease and continues the same through the height of the fever, becoming positive about the second week of the disease. A few cases never become positive. We have not been able to form any correlation between the degree of morbidity and the titer of

PATHOLOGY

In this disease we were able to find no distinctive gross pathologic changes aside from the characteristic cutaneous lesion and enlarged regional lymph modes. The picture in general is one of visceral congestion. We observed in the heart some petechial hemorrhages through both the pericardium and the myocardium. The cardiac musculature also was quite pale in appearance. The spleen and liver were slightly enlarged. The lungs

exhibited a patchy consolidation similar to an atypical pneumonia. In the brain there was evidence of a vaculitis in the pons and medulla.

DIAGNOSIS

The diagnosis of this condition should not be difficult. In many instances the history will be extremely helpful, the patient having been logging or having cleared sections where vegetation is dense. The endemic nature of the disease, together with the characteristic initial lesion, the regional lymphadenopathy, typical rash, presence of OXK and absence of OX2 and OX19 should prevent error. Mouse inoculation, using blood of the infected patient, and later demonstrating rickettsias in a smear made from pleural effusion, can be used to affirm the foregoing and differentiate the disease from Rocky Mountain spotted fever and typhus.

Typhoid can be excluded by the history, absence of the primary ulcer and the type and time of appearance of the rash, together with the positive Widal agglutination. In plague there rarely is a primary ulcer, the disease is typically epidemic, and the bacillus may be removed from the blood or sputum. The history of rat bite, the relapsing type of fever, leukocytosis, the characteristic rash, the recovery of the spirillum and absence of OXK will differentiate this condition from rat bite fever.

TREATMENT

The most important factors in the treatment of this condition is, in our opinion, absolute bed rest and adequate nursing care, following the line of symptomatic treatment. Acetylsalicylic acid has been found adequate in the control of the severe headache. We discontinued the use of codeine, for in many cases it led to an abdominal distention which interfered with food intake. Fluids and fruit juices are forced (ad libitum). Alcohol sponges, enemas and ice caps to the head are used to control the temperature, but apparently nothing has any effect in keeping it down. It has been reported by another group (Australian) that a fall in blood chlorides associated with a fall in blood pressure takes place. We have not been able to affirm this finding as yet owing to the field conditions under which we are working, though we attempt to maintain the chloride level by the oral administration of sodium chloride tablets. Under the regimen we find that the blood pressure remains stable though below normal. We do not feel that the sulfonamide drugs are of value in treating this condition. A number of our patients showing pneumonic signs were given sulfadiazine in adequate doses with no visible effect on the temperature, the duration or the pathologic changes in the lungs. Abdominal distention with nausea and vomiting was the most difficult problem with which we had to contend. Because of the myocardial pathologic condition, a perivascular infiltration of lymphocytes and monocytes throughout the cardiac musculature, we feared giving large doses of saline solution and dextrose by vein. Fifty cc. of 50 per cent dextrose given every four to six hours, in several cases, seemed to be tolerated well. A mild degree of dehydration does not appear to affect the course of the disease. If fluids must be given parenterally, hypodermoclysis is the method of choice. The vitamin need is important both in the active and in the convalescent phase of the disease. Vitamin B complex should be given, supplemented with large doses of multivitamin capsules. Digitalis when given in these cases showing signs of beginning cardiac failure seems to have no effect on the rate or the rhythm, nor does it affect the outcome in any way. The role of oxygen in the treatment of this condition is overrated. We believe that the dyspnea is due to a venous stasis and a myotonia of all the muscles involved in respiration plus possibly a central respiratory depression. Anxiety and fear play also a major role in this phase of the disease. We have found that with reassurance and sedation this phase subsides. The use of sedatives cannot be overemphasized. Enough must be given to stop the nervousness and allay the anxiety as well as to insure adequate rest. Some clinicians have used lumbar puncture for relief of the cerebral symptoms, but we have found no indication for its use. The use of convalescent serum occurred to us on many occasions, but we feared its use for two reasons: 1. We do not know when the blood stream of the convalescent is free from rickettsias. 2. Would the patient stand the shock of its use? We could not attest the value of immune serum, for we had none. The importance of this disease can be realized only when one examines the facts. Malaria lends itself to treatment readily and has an exceedingly low mortality rate, with only about fourteen man days lost. Tsutsugamushi fever, on the other hand, lends itself to treatment very poorly and has a fairly high mortality rate (considering other figures), with at least one hundred man days lost.

Understanding these facts, the seriousness of the problem cannot be overlooked.

PROPHYLAXIS

We have no information at this writing that inoculation to prevent tsutsugamushi fever in man has proved to be of value. Vaccines from the other rickettsial fevers have had no appreciable effect as a prophylactic measure. The prevention of this disease is largely one of individual protection, the use of insect repellents, proper clothing and the adequate preparation of the site to be subsequently occupied by troops.

The present type of warfare calls for rapid movements of large bodies of troops. This tends to favor exposure to this disease. We advise strongly that where possible areas to be occupied by troops for even short periods be adequately cleared of grass and vegetation by advance details. Natives are often able to give valuable information concerning the conditions in any specific area and should be engaged to assist in preparing the camp site. Troops if possible should employ native labor for any logging required in the construction of buildings.

The camp site is best prepared by cutting and then burning the entire area. This assists in destroying the favorable habitat for infected rodents, and while it does not guarantee destruction of mites it permits the sun to dry the ground sufficiently to produce unfavorable conditions for their existence. Needless to say, the use of rat poison to control the rodent population is necessary.

Troops passing through areas where the disease has been known to occur should at no time be permitted to sleep on the ground. Among paratroops this may become a difficult problem. The use of a hammock of simple construction and of a light weight might prove a solution. In permanent and semipermanent camps, sleeping quarters should be elevated to 4 feet off the ground. Where possible, spraying of the infested ground with a petroleum emulsion is highly advisable.

For individual protection the socks and lower portion of the trousers should be treated with repellent. Apply a small quantity, sufficient to wet the palmar surface of

both hands, then smear over socks and an area up to 6 inches above the trouser cuffs. A high boot or footgear can then be pulled on over the socks. Dusting the body with equal parts of sublimed sulfur and talcum is also recommended.

We have found in a series of experiments that the repellent now in use by the U. S. Army is highly satisfactory if properly applied. The secret of most repellents is knowing how to use them. In our series of experiments to determine the effect of commonly used insect repellents on larval mites it was found that larval mites will not pass through the ordinary khaki uniform worn in tropical areas. The mites will, however, penetrate the mesh of the standard issue wool socks but their progress is greatly deterred. With the treated sock, the arthropod is dead before being able to pass through the sock to the skin. Repeated lectures and demonstrations on the use of repellents by the individual unit are of great value, emphasizing also the need to follow each day's work by a thorough soap-up and shower or bath.

The use of the much talked about mite proof suit as devised by Hayashi and Nagayo appears costly and unpractical. The use of solution of sulfurated lime to bathe the parts of the body exposed to mite bites has been suggested by other workers, but we have had no experience with it.

AMERICAN RED CROSS BLOOD DONOR SERVICE

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The American Red Cross Blood Donor Service is the sole agency through which the men and women of this country give their blood to the Army and Navy for the preparation of plasma and serum albumin. From its inception in February 1941 [1] until Nov. 1, 1943 the Blood Donor Service has collected almost 5,000,000 pints of blood. The service has undergone enormous expansion during the past year in order to accomplish this production. In a project of such scope dealing with so many individuals from coast to coast, it is only natural that all phases of its operation are, and should be, continually before the professional and public eye. This, in effect, is a report concerning the activities of the service, both from the medical and from the statistical point of view.

SCOPE

The American Red Cross Blood Donor Service at present is undoubtedly one of the largest controlled medical projects ever undertaken. As the service looks forward in the next twelve months to continuation of the present scale of activity, it will probably approximate in numbers the large inoculation and vaccination programs. At present thirty-five blood donor centers are in operation in the larger cities of the country.[2] Their work is augmented by sixty mobile units, which operate from these centers and extend their activity to seven hundred and eighty additional cooperating chapters of the Red Cross. Through their combined activity they reach approximately 45 per cent of the estimated population of the country. During the past six months between 95,000 and 110,000 donors have appeared each week either at the centers or on mobile unit stations. Considering the age limits and the health standards imposed, and with allowance for those in the armed services, the program would require that 1 out of every 4 persons in the areas covered by the Blood Donor Service would have to contribute a pint of blood within the next twelve months to maintain the program. As will be seen, actually the present rate of redonations is such that this vast coverage will not be necessary.

TECHNIC AND EQUIPMENT

The fundamental conception of the bleeding technic as previously described remains the same.[3] However, with increased efficiency gained by experience in the service, production per doctor and nurse has greatly increased. This has been made possible by the untiring efforts of a vast number of Red Cross volunteers, many of whom have devoted as much time to the project as the full time paid personnel. The 100,000 donors who appear each week to give blood are examined and cared for by 129 physicians and 911 nurses. This concentration of professional services has been accomplished only by insistence on full time personnel to carry out the essential procedures and by the transfer of as much responsibility as is compatible with safeguarding the donor—first from doctor to nurse and second from nurse to nurse's aide and other qualified Red Cross volunteers. Eighty per cent of the physician personnel has been provided by the Army and Navy. These medical officers are either on limited service or have a temporary disability that makes them unsuitable for the time being for combat duty. The centers have adopted the same general plan of moving the donors on an assembly line basis, and all employ the open bleeding room arrangement. In this way 2 donors are cared for by 1 nurse, and the entire room can be overseen by a single physician. The appearance of the centers, on an overall appraisal, is essentially the same.

The bleeding bottle is identical with that previously described [1] and has proved satisfactory in this greatly enlarged operation. The actual bleeding technic is the same and follows in detail that originally outlined.[3] The safety and efficiency of this technic are borne out in the statistics to be noted.

STANDARDS

As stated originally, the first consideration of the service has always been the protection of the donor.[4] This has been effected by a carefully controlled basis of operation and uniform technic, and by a rigid adherence to donor standards and requirements. There has been little fundamental change from the donor requirements as originally set forth.[3] Minor changes [5] have been adopted on the basis of experience and mainly cover unusual situations that have come up in dealing with such a large number of donors—approximately 2,000 per working hour throughout the country.

During this calendar year no donors have been accepted who have a history of jaundice in the preceding six months. This stipulation was considered

1. Taylor, E. S.: Blood Procurement for the Army and Navy, J. A. M. A. **117**: 2123 (Dec. 20) 1941.
2. All statistics are based on thirty centers, as three have until recently produced liquid plasma jointly with the United States Army, and two were opened in January 1944.
3. Taylor, footnotes 1 and 4.
4. Taylor, E. S.: Procurement of Blood for the Armed Forces, J. A. M. A. **120**: 119 (Sept. 12) 1942.
5. Heiss, M. E., and Taylor, E. S.: Standards for the Protection of Blood Donors, Hospitals **17**: 31 (Nov.) 1943.

necessary because of the possibility that a virus of "infectious jaundice" might be transmitted through plasma.[6] Interrogation of 3 million donors appearing for examination during this period indicated that only 325 gave such a history. A compilation of such information is of interest from a public health standpoint in the areas in which the service operates.

COMPLICATIONS

The final test of the efficiency of the standards employed and technics used is the incidence of complications and accidents, coincidental and otherwise, that occur in the donor population. There is a considerable amount of self selection on the part of the donors which in itself militates against many complications. Rather consistently since operations began, from 8 to 8.5 per cent of the donors have been refused because of some variation from the standard requirements. In the selected group which remains, the number of complications and accidents encountered, particularly those of a serious nature, has been far below normal expectancy. There have been no fatalities in or about any of the centers or their temporary mobile unit stations. Of the eight cardiovascular accidents to donors that have occurred in the centers, not one has been fatal.

Although statistical evidence and compiled data are essential in evaluating the safety and protection factors, the donor's own impressions and reactions to the procedure and its effect on his or her well-being are even more significant. In a study over a three month period it was found that 47 per cent of the donors throughout the country were redonors, many of these coming in for their fourth or fifth donation. This implied endorsement by a large number of donors is further documented[5] in a postcard follow-up on 39,642 donors at four centers, in which a response was obtained from 68.2 per cent. Eighty-one per cent of the group which responded registered no type of complaint. Of the 19 per cent making some comment, only 4 per cent noted anything more than a transient effect, either generally or with reference to the site of the venipuncture. The most informative figure obtained was that only 0.1 per cent of this group had experienced delayed syncope.

The occurrence of delayed syncope is of particular concern when the donor services operate in industrial plants. It is for this reason that no donors who work with or about any type of heavy machinery are bled unless an eight hour interval will elapse before they return to work. In order that this may be carried out, many groups can be reached safely only by having a mobile unit go to the plant when the donors come off shift. Evidence regarding the safety of blood donation in industry has been presented in a general survey by the Industrial Hygiene Foundation.[7] In a large heavy industry plant, with a population of some 82,000 workers, 39,250 pints of blood has been taken without any record of a serious accident and no evidence of absenteeism or lag in production. The redonor rate in this plant is nearly 40 per cent.

INVESTIGATION

The scope of the project has offered a unique opportunity not only to obtain statistical information but also to evaluate a number of medical problems. Such investigations have in general come under two headings: (1) the donor and (2) the final product, plasma or its by-products.

1. *The Donor.*—(*a*) Positive Serologic Reactions: The incidence of positive serologic reactions to date has been 0.32 per cent, or 15,197. This low incidence is accounted for in two ways: (1) the high percentage of redonors and (2) the selection on the part of the donors themselves. All instances of positive serologic reactions are followed up, preferably through the donor's own physician, both to fulfil the public health obligation incurred and to perform a service to the donor, who is usually not cognizant of the existence of this condition.

As the number of redonors has increased, a significant number of positive serologic reactions has been reported on donors who already have given blood several times and in whom the previous serologic tests have been negative. This problem is being thoroughly investigated.[8] It would seem from preliminary results that there are several possible explanations, of which two are of major interest: (1) that repeated donations of blood reactivate an old treated or latent syphilis (provocative reaction); (2) that a change occurs in the globulin or other fraction of the donor's serum after repeated bloodletting which will result in a "false positive" reaction.

(*b*) Hemoglobin: The Tallqvist method of hemoglobin determination has been standard procedure for all centers. This method was selected on the basis of previous experience with donor groups[3] as well as for its speed and simplicity. However, in a project of this size it was felt that the donors should be further safeguarded by checking this type of determination with other methods, e. g. photoelectric cell colorimeter (Evelyn) and the recently developed copper sulfate specific gravity methed of Phillips and his collaborators.[8a] As a result of these studies a modification of the latter method has been adopted for general use in the centers.

(*c*) A recent article by Master, Marks and Dack[9] raised some interesting questions with regard to "normal blood pressure," particularly in the age groups over 40. In collaboration with these authors a study is now being made on approximately 25,000 donors to obtain further information on some of these questions.

(*d*) Syncope: Syncope and the various phenomena associated with it present a continuous and complex problem to the Blood Donor Service. Consistently throughout the country there is some form of "reaction" in 4 to 6 per cent of the donors. Considerable interest has been evinced both in this country and in Great Britain with regard to "fainting in blood donors,"[10] but there has been to date no satisfactory evidence presented that has explained this phenomenon in all its variations.

6. Oliphant, J. W.; Gilliam, A. G., and Larson, C. L.: Jaundice Following Administration of Human Serum, Pub. Health Rep. **58:** 1233 (Aug. 13) 1943. Findlay, G. M., and Martin, N. H.: Jaundice Following Yellow Fever Immunization; Transmission by Intranasal Instillation, Lancet **1:** 678 (May 29) 1943. Infective Hepatitis and Jaundice, editorial, ibid. **1:** 683 (May 29) 1943. Beeson, P. B.: Jaundice Occurring One to Four Months After Transfusion of Blood or Plasma, J. A. M. A. **121:** 1332 (April 24) 1943. Homologous Serum Jaundice, memorandum prepared by Medical Officers of Ministry of Health, Lancet **1:** 83 (Jan. 16) 1943. Unexplained Jaundice, editorial, ibid. **1:** 77 (Jan. 16) 1943. Morgan, H. V., and Williamson, D. A. J.: Jaundice Following Administration of Human Blood Products, Brit. M. J. **1:** 750 (June 19) 1943.

7. What About Blood Donations by War Workers? Industrial Hygiene Foundation, Pittsburgh, April 1943 (pamphlet).

8. Moore, J. E.; Rein C., and Barnard, R. C.: Personal communication to the authors.

8a. Phillips, R. A.; Van Slyke, D. D.; Dole, V. P.; Emerson, K., Jr.; Hamilton, P. B., and Archibald, R. M.: The Copper Sulfate Method for Measuring Specific Gravities of Whole Blood and Plasma, Bull. U. S. Army M. Dept. **71:** 66-83 (Dec.) 1943. (Special condensation of article in full in the Navy Dept. Bumed. News Letter, June 25, 1943.)

9. Master, A. M.; Marks, H. H., and Dack, S.: Hypertension in People Over Forty, J. A. M. A. **121:** 1251 (April 17) 1943.

10. Poles, F. C., and Boycott, M.: Study of Syncope Among Blood Donors, Lancet **2:** 531 (Nov. 7) 1942. Greenbury, C. L.: Incidence of "Fainting" in 5,897 Unselected Blood Donors, Brit. M. J. **1:** 253 (Feb. 21) 1942. Brown, H., and MacCormack, P.: An Analysis of Vasomotor Phenomena (Faints) Occurring in Blood Donors, ibid. **1:** 1 (Jan. 3) 1943.

There is a critical amount of blood which can be withdrawn from the healthy adult.[11] After approximately 1,000 cc. of blood has been taken, syncope and other striking vasomotor changes will occur in most persons. However, this does not explain either the number of syncopes that occur when no more than 200 cc. has been withdrawn or those that occur when the finger is pricked to obtain blood for a hemoglobin determination. In an attempt to appraise this problem, a questionnaire survey was undertaken on 5,030 donors, 2,292 of whom had some type of vasomotor reaction; the remaining 2,738 were utilized as controls. An effort was made to obtain information on all the possible factors that are thought to be conducive to syncope, either directly or indirectly. The findings were tabulated on punch cards, and the following general impressions were gathered:

Females react more frequently than males by a ratio of 1.5:1. Young persons, particularly females under 21, are apparently more susceptible than those in later adult life. These reactions, however, are mild and transient, whereas the more severe reactions occur in the upper age brackets. Both males and females in the so-called white collar class show a higher proportion of reactions than those in the more physically strenuous occupational groups. This is in general agreement with British findings.[10]

The incidence of reactions is four times greater among first donors than among redonors. This is to be expected, as first time donors are not solicited to return if they have had a reaction at the time of their first donation. A history of fainting invariably predisposes to syncope. Donors are often loath to admit to this on routine interrogation, and such a history can often be elicited only after the donor has experienced syncope.

Apprehension on the part of the donor seems to be one of the most important factors in predisposing the otherwise acceptable donor to syncope. The question of the relationship of this factor to certain psychosomatic features of the donor is difficult to evaluate but offers a most promising field of investigation. It is hoped that this preliminary study will serve as a basis for a detailed investigation of the more suggestive causative factors.

There are two forms of reactions that are encountered from time to time which are of particular interest:

1. A small number of donors develop tetany with carpopedal spasm and positive Chvostek and Trousseau's signs. It has been suggested that this may be due to hyperventilation and/or a calcium-phosphorus imbalance.[12] No studies have been done on this group, but in a number of instances hyperventilation has been observed prior to the onset of tetany. Empirically, some of these donors have been treated with carbon dioxide and others with calcium lactate intravenously. Response to treatment has been very striking in some cases; in other cases recovery can hardly have been attributed to the therapy.

2. The other, and equally disturbing, group consists of those donors who have convulsions. This phenomenon, which occurs in less than 1 per thousand donors, has been encountered in almost every step of the procedure. A number of these donors, on further interrogation, have admitted to previous "fits" or convulsive states occurring usually many years before, with no history of such phenomena in the interim.

In order to evaluate this group further, Walter [13] of the Boston center and Moore [14] of the St. Louis center did encephalograms on a number of these donors. In the 8 tested by Moore, no significant data or information was obtained. In four of the series of 28 investigated by Walter, the encephalograms suggested the typical pattern of subclinical epilepsy, but the findings were not conclusive.

2. *Plasma and Its By-Products.*—(*a*) The red cell residues remaining after the withdrawal of the plasma-citrate mixture are now being more extensively used.[15] Not only are these residues distributed for use in Army and Navy hospitals, but they are also being offered without cost for clinical investigation to some civilian hospitals that are in proximity to the various processing laboratories.

A considerable number of red cells have been diverted to the production of human peptone for use as culture mediums.[16]

Use of red cell residues, both in the liquid and in the dried state, to promote the healing of indolent wounds and ulcers has been reported.[17] Circumstances have prevented any study by this service of the use of the red cells in this manner.

(*b*) The question has been raised as to whether or not pooled dried plasma can cause reactions because of the agglutinin titer of the pools.[18] To evaluate this question, agglutinin titers have been done on several thousand pilot samples from pools of plasma which have been prepared for the Army and Navy. The samples were chosen at random at each of the processing laboratories. The results of these studies are reported in a separate paper.[19] A standard method of agglutinin titration has been developed which may enable the various workers in this field to make their reports regarding titration comparative.

RESULTS

From Feb. 3, 1941 to Nov. 1, 1943 prospective donors have offered to give blood 5,259,115 times; 4,162,483 of these donors offered to donate within the past twelve months. This represents, on the basis of the number of redonors, approximately 2,500,000 individuals. From this donor group 4,762,308 pints of blood has been obtained; 418,080 donors have been either permanently or provisionally (upper respiratory infection and so on) rejected, a rate of 8 per cent. This rejection rate is uniform throughout the country and varies little with the season of the year. In 78,727, or 1.6 per cent, of the donors accepted, the bleeding team has been unable to obtain blood. It should be noted that no accepted donor is turned away without at least one attempt to obtain blood, no matter how unsuitable the veins appear to be.

Taking into consideration the average hematocrit reading and the 50 cc. of 4 per cent sodium citrate con-

11. Ebert, R. V.; Stead, E. A., Jr., and Gibson, J. G. II: Response of Normal Subjects to Acute Blood Loss, Arch. Int. Med. **68**: 578 (Sept.) 1941.

12. Frazer, W. F., and Fowweather, F. S.: Tetany in Blood Donors, Brit. M. J. **1**: 759 (June 20) 1942.

13. Walter, C.: Personal communication to the authors.

14. Moore, C.: Personal communication to the authors.

15. Taylor, E. S.; Thalhimer, W., and Cooksey, W. B.: A Red Cell Transfusion Service, to be published.

16. Parke-Davis Laboratories: Personal communication to the authors.

17. Moorehead, J. J., and Unger, L. J.: Human Red Cell Concentrate for Surgical Dressings, Am. J. Surg. **50**: 104 (Jan.) 1943. Seldon, T. H., and Young, H. H.: Use of Dried Red Blood Cells in Wound Healing, Proc. Staff Meet., Mayo Clin. **18**: 385-389 (Oct. 20) 1943.

18. Polayes, S. H., and Squillace, J. A.: Near Fatal Reaction to Transfusion with Dried Human Plasma Solution, J. A. M. A. **118**: 1050 (March 28) 1942. Levine, M., and State, D.: A and B Substances as Cause of Reaction Following Human Plasma Transfusions, ibid. **120**: 275 (Sept. 19) 1942. Thalhimer, W.: Intravenous Injection of Pooled Normal Plasma or Serum, ibid. **120**: 1263 (Dec. 19) 1942.

19. Lozner, E. L., and Newhouser, L.: To be published. Thalhimer, W.: Personal communication to the authors.

tained in the bottle, most of which is drawn off in the supernatant plasma, it would be ideal to obtain one finished unit of plasma (300 cc.)[20] from each full bleeding (550 cc.). Considering losses from all sources—breakage, positive serologic reactions, hemolyzed and clotted samples, material denatured because of breakdown in the drying process—the ratio of bleedings per finished package of plasma since the beginning of the project is 1.079: 1. Total losses from contamination are 1.12 per cent; the loss from mechanical defects, i. e. breakage and processing breakdowns, 1.35 per cent; positive serologic reactions, 0.32 per cent. This makes a total loss of 2.77 per cent, or a ratio of 1.03: 1. However, this figure presupposes that every bottle delivered to the laboratory contains 550 cc. and leaves no provision for sterility samples and filling losses, which are accounted for in the final ratio. It may be stated that the occasional outbreaks of contamination which occur can usually be attributed to some oversight in the sterilization of the donor sets, pooling bottles or filling apparatus at the laboratory.

Except for the breakage of bottles as they arrive with whole blood, the aforementioned "losses" are actually losses in only a relative sense. A large amount of the contaminated material contains only a relatively small number of organisms and may be salvaged for use in the albumin program if the organisms are not pyrogen formers. Other material is used for moisture samples and the like, so that in reality only the smallest fraction of the amount of blood donated is lost.

Of the blood collected, approximately 4,000,000 bottles have been used in the production of dried plasma for the armed services. Approximately 788,000 bleedings have been employed in the human serum albumin program. Delivery of the finished product parallels the rate of receipt of the whole blood.

In the latter months of 1942, frozen and dried plasma derived from nearly 100,000 bleedings obtained by the Blood Donor Service was made available to the U. S. Public Health Service to be used by the Emergency Medical Service of the Office of Civilian Defense in the event of a civilian disaster caused by enemy action. Blood for such use is now collected under the auspices of the Emergency Medical Service of the Office of Civilian Defense through its grantee hospitals. However, in the event of a catastrophe, the chief of the local Emergency Medical Service may call on the technical supervisor of an American Red Cross Blood Donor center to provide whole blood as such or as a source of replacement for Office of Civilian Defense supplies of plasma that may have been utilized for a natural disaster rather than one caused by enemy action. This has been found to be a useful and practical supplementary function of the Blood Donor Service on several occasions.

About 6,000 units of dried plasma has also been released by the Surgeon General of the Army to the American Red Cross and is held by the Disaster Relief Service in various parts of the country. This constitutes a source of plasma to be used to meet the needs of the civilian population that may occur, because of a catastrophe not related to the war.

SUMMARY

1. The American Red Cross Blood Donor Service, as the sole agency for the collection of blood to be processed into plasma and albumin for the armed forces, procured 4,762,308[21] pints of blood up to Nov. 1, 1943. At present donors are being accepted at the rate of 110,000 per week.

2. The Blood Donor Service, through its 35 centers and their 60 mobile units, offers to 45 per cent of the total population of this country the opportunity to donate blood.

3. The work of the Blood Donor Service is carried out by 129 doctors and 911 nurses, with the additional help of a large number of Red Cross volunteers.

4. The donor requirements and the method of procedure are rigidly standardized throughout the service.

5. The scope of this project has provided an opportunity for various studies and the investigations which have been outlined.

6. Because of the employment of full time experienced personnel and standardized methods of procedure, operational losses have been minimal.

20. The standard Army-Navy plasma package now being supplied contains twice the amount of plasma-citrate mixture that it formerly did, i. e. 600 cc.

21. As of March 1, 1944 the total bleedings procured at the centers amount to approximately 6,400,000.

ISCHEMIC MUSCLE NECROSIS

CRUSHING INJURY, TRAUMATIC EDEMA, THE CRUSH SYNDROME, TRAUMATIC ANURIA, COMPRESSION SYNDROME: A TYPE OF INJURY SEEN IN AIR RAID CASUALTIES FOLLOWING BURIAL BENEATH DÉBRIS

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When in 1940 the air blitz on London started, we expected to see patients with "shock," a mysterious condition with as many definitions as there are writers on it, something that could be produced by natural processes such as burning, bleeding and bruising, as well as by such unnatural practices as injecting histamine, ground up muscle tissue and snake venom, and roentgen irradiation. The patients that we saw were suffering from the consequences of aerial bombardment. Most of them were only frightened—pale, rather cold, often described as "shocked." But the blood pressure was often rather above normal, and all they needed was rest and reassurance. Others we saw had severe lacerations; their pallor, coldness and sweating were accompanied by a low blood pressure and by a gradual hemodilution such as could be explained by the severe hemorrhage they had had. This surely was nothing mysterious but a reaction to blood loss, and when we remedied this by transfusion all went well. And then at last, rather later than the other casualties that had been admitted, some patients arrived who appeared to merit this label. With signs neither of external nor of internal hemorrhage these patients were pale, cold and sweating: the radial pulse was thready and weak, their blood pressure was low, and their blood showed hemoglobin concentrations of 140 and 160 per cent Haldane (19-22 Gm. of hemoglobin per hundred cubic centimeters). Was this not the same "shock" that had been seen in World War I when Cannon and his associates[1] described cases with hemoconcentration? Since then, although Moon[2] avers that hemoconcentra-

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1. Cannon, W. B.: Traumatic Shock, New York and London, D. Appleton & Co., 1923.
2. Moon, V. H.: Shock, London, Henry Kimpton, 1942.

tion occurs in "shock," few other observers have found it except after severe burns, after intestinal injuries or in dehydration. Now all these patients gave a history of burial beneath débris for several hours, often with compression of a limb by fallen masonry: the affected limb was swollen—perhaps, we conjectured, because of plasma leakage. Whether this was so or not, it appeared that plasma had been lost from the blood stream, and so therefore we replaced it and with excellent results. The blood pressure rose, the hemoglobin level came down and the patient seemed on the highway to recovery. In the rush of work the first urines were often discarded without testing, but later what were thought to be red cells were seen, suggesting a genitourinary injury; some of these patients developed oliguria and died in uremia with pathologic changes in the kidneys. With this lead, later cases were studied more carefully and a clinical entity emerged of which "shock" was only a facet. This was a specific response to a specific type of trauma: the clinical syndrome called "shock" is only a part of many diverse processes set in motion by various noxious agencies, conspicuous because common to all. The abstraction of certain common features from all types of trauma and the labeling of these as "shock," the conception of "shock" as a real entity with a cause and a mechanism, with as many books and papers written about it as were written about that other fabulous concept the unicorn in more ancient times, seemed to us to have done more harm than good. What was needed was a careful study of specific responses to trauma. This the Medical Research Council set out to do for "crushing injury." Cases of this nature were notified through the Emergency Medical Service by observers in all parts of the country, and the M. R. C. has now particulars, sometimes scanty, sometimes more detailed, of about 100 cases. While most of this material is as yet unpublished, protocols of the earlier cases may be seen by reference to the original publications.[3] The following brief account has been compiled from material collected by the M. R. C. and its observers in Britain to familiarize readers in the United States with the salient features of the condition and with the present state of knowledge in this country regarding pathogenesis and treatment.

PREVIOUS LITERATURE

Despite the occasional occurrence of this type of injury in civil accidents apart from aerial bombardment, as after mining accidents (McClelland[4]), traffic accidents (Bywaters, Belsey and others[5]), industrial accidents (Glen[6]) and mob stampedes (unpublished data), the condition seems heretofore unrecognized in English speaking countries. In Germany, however, the condition was recognized during World War I. Frankenthal[7] in 1916 was the first to describe muscle necrosis in soldiers buried as a result of mine explosions, and reference is made to a probably similar injury recorded by von Colmers[8] in 1910, in civilians buried during the Messina earthquake This aspect is dealt with in the official Handbook of Military Surgery (Kayser[9]). Anatomic changes in the kidney were first mentioned by Hackradt in 1917 and Bredauer in 1920, whose findings are summarized, with those of other German authors, by Minami.[10] It appears probable that, as we failed to recognize the condition in World War I because of the distance from the front line to the base hospital with its better equipped facilities for investigation, so we have failed to recognize the similar condition in traffic accident cases owing to the exclusive attention directed to the surgical aspects of these severe injuries. The only reference to these traffic accident cases that we have been able to find is the paper of Husfeldt and Bjering[11] from Oslo. In this war many air raid cases still pass unrecognized, particularly those with less severe degrees of damage, frequently diagnosed as "foot drop." However, publication of the air raid cases has stimulated the recognition of uremia following civilian accidents in this country, and it is to be expected that similar cases will be found in other automobile using countries. In large night raids on urban areas, crushing injury may account for about 5 per cent of all casualties.

CONDITION ON ADMISSION

Any patient admitted from a bombed area two hours or more after the incident must be questioned carefully as to whether he was buried or pinned down, and for how long: if there was compression for two to three hours or more, the patient will say that the limb was very painful for a short time and then went numb. On examination—and some patients are unable to give any adequate history—as soon as the grime and plaster are cleared away, patches of erythematous skin are seen delineating accurately the area of compression. The whole body must be examined: while in most cases the limbs are involved, in a few, areas of pressure on the trunk or neck have been responsible for symptoms. In fat people particularly the deep swelling which follows is very liable to be missed if the trunk is affected. The erythematous areas may progress to blister formation, which have several times been mistaken for burns. Soon after release from the compression the affected limb becomes swollen and hard: there is no subcutaneous, pitting edema, as the fluid is almost entirely beneath the deep fascia. The affected muscle is insensitive and paralyzed: superficial skin sensation is lost, usually over a rather patchy distribution, but sometimes corresponding to nerve trunk lesions. Later the tenseness passes off, palpation elicits a peculiar "doughy" sensation and pitting edema can appear.

3. Protocols of the earlier cases:
Bratton, A. B.: Anuria with Casts Not Associated with Transfusion, Lancet **1**: 345 (March 15) 1941.
Beall, D.; Bywaters, E. G. L.; Belsey, R. H. R., and Miles, J. A. R.: A Case of Crush Injury with Renal Failure, Brit. M. J. **1**: 432 (March 22) 1941.
Mayon-White, R., and Solandt, O. M.: A Case of Limb Compression Ending Fatally in Uremia, ibid. **1**: 434 (March 22) 1941.
Medical Research Council Subcommittee on Traumatic Edema: Further Cases of Crush Injury, ibid. **1**: 449 (March 22) 1941.
Patey, D. H., and Robertson, J. D.: Compression Treatment of Crush Injuries of Limbs, Lancet **1**: 780 (June 21) 1941.
Henderson, R. G.: Recovery from Uremia Following Crush Injury, Brit. M. J. **2**: 197 (Aug. 9) 1941.
Blackburn, Guy, and Kay, W. W.: Crush Injury with Renal Failure and Recovery, ibid. **2**: 475 (Oct. 4) 1941.
Maitland, A. I. L.: A Case of Crush Injury with Recovery, Lancet **2**: 446 (Oct. 18) 1941.
Dunn, J. S.; Gillespie, Marjorie, and Niven, J. S. F.: Renal Lesions in Two Cases of Crush Syndrome, ibid. **2**: 549 (Nov. 8) 1941.
Morison, J. E.: Obstruction of Renal Tubules in Myelomatosis and in Crush Injuries, J. Path. & Bact. **53**: 403 (Nov.) 1941.
Bradley, E. J.: Crush Injury with Renal Failure: Recovery, Brit. M. J. **1**: 294 (Feb. 28) 1942.
Robertson, H. R., and Mathews, W. H.: Crush Syndrome, Canad. M. A. J. **46**: 116 (Feb.) 1942; correction **46**: 375 (April) 1942.
Bywaters and Beall.[57] Longland and Murray.[58]

4. McClelland, J. C.: Anuria: Report of Three Types of Cases, Canad. M. A. J. **45**: 332 (Oct.) 1941.

5. Bywaters, E. G. L.; Belsey, R. H. R. and others: Discussion on the Effects on the Kidney of Trauma to Parts Other than the Urinary Tract, Including Crush Syndrome, Proc. Roy. Soc. Med. **35**: 321 (March) 1942.

6. Glen, A. M.: Temporary Vascular Occlusion Ending Fatally in Uremia, Brit. M. J. **2**: 875 (Dec. 20) 1941.

7. Frankenthal, L.: Virchows Arch. f. Path. Anat. **222**: 332, 1916.

8. von Colmers: Arch. f. klin. Chir. **90**: 701, 1909.

9. Kayser, F. F. O., in von Schjerning's Handbuch der ärztlichen Erfahrungen im Weltkriege, Leipzig, Chirurgie **1**: 36, 1922.

10. Minami, S.: Virchows Arch. f. Path. Anat. **245**: 247, 1923.

11. Husfeldt, E., and Bjering, T.: Renal Lesion from Traumatic Shock, Acta. med. Scandinav. **91**: 279, 1937.

OLIGEMIC HYPOTENSION

The general condition of the patient may at first give rise to no concern: the blood pressure is normal or slightly raised. Within a few hours, however, in patients with extensive lesions (one leg and thigh, or more), the damaged area swells and the blood volume is correspondingly reduced by plasma leakage through the damaged capillaries into the extravascular tissue spaces of the injured part. The patient becomes pale and cold; beads of sweat stand out on his forehead, and the pulse becomes thin. The blood pressure is maintained at its previous level by arteriolar vasoconstriction, until a moment arrives when this process can no longer compensate for the decreasing blood volume (due to continued plasma loss). At this juncture, which may be precipitated either by warming the patient under an electric bulb cradle or by anesthesia preliminary to operation, the blood pressure will fall to levels of 60-80 mm. systolic or lower, and the blood will be found maximally concentrated with a hemoglobin level of 140-160 per cent Haldane (19-22 Gm. per hundred cubic centimeters) and a raised plasma protein concentration. If the patient has bled, as from a scalp wound, this hemoconcentration will be masked by a parallel hemodilution and the net change may be very small (chart 1). Oligemia with hemoglobin 160 per cent Haldane corresponds to a plasma volume of 1 liter: it must be treated—and preferably before the hypotensive phase—by plasma or serum transfusion. Often more than the lost 2 liters may have to be used, as the injected fluid merely leaks out. Restraint of this continued local loss may prove to be a useful measure, as by the bandages suggested by Patey and Robertson[12] or by the plaster casts used by Trueta. There is some experimental evidence (Duncan and Blalock,[13] Swingle[14]) that such measures will diminish the severity of "shock" in untreated dogs with legs crushed in a spring clamp and in other types of local shock-producing damage.[15] Whether or not bandaging or plaster will decrease or increase the uptake of the hypothetical nephrotoxin from the damaged area in the animal is uncertain from the data so far published. In human cases a plaster, put on before maximal swelling, may later cause obliteration of the arterial pulse and have to be removed if further damage is to be avoided.[16] It seems probable that after some twenty-four hours plasma leakage is halted, perhaps by recovery of normal capillary permeability aided by increased tissue tension and reduction of extravascular osmotic pressure due to metabolites. The aim, therefore, of plasma transfusion is to maintain blood pressure at a normal level for the first day, and for this purpose a continuous infusion is necessary. If more than 2 liters is necessary, whole blood should be used, as the hemoglobin often tends to fall in these severe cases, leaving a residual anemia. The mechanism of this is as yet unknown: diapedesis and thrombosis in the damaged area would seem to play only a small part.

THE LOCAL CONDITION

In some cases as the swelling in the limb increased, either spontaneously or following intravenous fluid, the distal pulse decreased and the foot or hand became pale and cold. Oscillometric readings confirmed the diagnosis of ischemia. In some cases the blood flow returned spontaneously and then the pulse was often greater than in the opposite uninjured member. In other cases the surgeon, thinking that perhaps the swelling of the muscle in the deep fascial compartment was compressing the artery, made an incision along the course of the artery: much serous fluid seeped from the wound and pale necrotic muscle bulged out. Obviously there had been a great increase of tension locally, which had perhaps obliterated the venous return. Following this procedure, in some cases a pulse was restored distally: in others the artery was found to be in spasm and periarterial stripping was thought necessary. It seems probable that arterial spasm alone without much increase of subfascial tension may sometimes be responsible for peripheral ischemia, particularly if hemorrhage into the adventitial sheath has occurred.

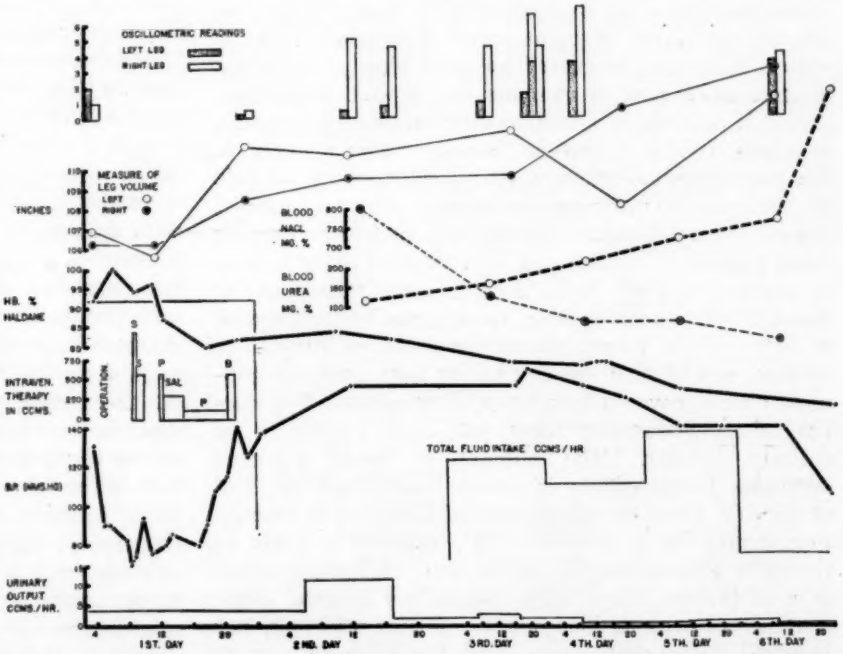

Chart 1.—Clinical course of a crushing injury case (Bywaters and Beall[27]) buried six hours. Note from above down: 1. Return of circulation to legs as measured by oscillometer readings. 2. Increase in leg volume measured by spiral bandage. 3. Hemoconcentration and later hemodilution shown by hemoglobin level. 4. Blood pressure fall and restoration after transfusion. 5. Decreased urine output with rising blood urea. Urine contained pigment granules and casts and failed to concentrate urea above 670 mg. per hundred cubic centimeters. Necropsy showed blanching and necrosis of muscle in both legs and a typical swollen kidney.

12. Patey, D. H., and Robertson, J. D.: First Aid Prophylactic Treatment of the Compression Syndrome ("Crush Syndrome"), Brit. M. J. **2**: 212 (Aug. 22) 1942.

13. Duncan, G. W., and Blalock, Alfred: Shock Produced by Crush Injury: Effects of Administration of Plasma and Local Application of Cold, Arch. Surgery **45**: 183 (Aug.) 1942; Effects of Application of Tourniquet on the General Response to Gross Trauma to an Extremity, Surgery **13**:401 (March) 1943. Uniform Production of Experimental Shock by Crush Injury.[30]

14. Swingle, W. W.; Remington, J. W.; Drill, V. A., and Kleinberg, W.: An Experimental Study of the Tourniquet as a Method for Inducing Circulatory Failure in the Dog, Am. J. Physiol. **138**: 156 (Dec.) 1942.

15. Katz, L. M.; Shleser, I. H.; Asher, R., and Perlow, Samuel: Prevention of Experimental Shock Following Venous Occlusion in Dog by Application of a Rigid Cast, Am. J. Physiol. **137**: 589 (Oct.) 1942.

16. Belsey: Personal communication to the author.

RENAL FUNCTION

The first urine passed after admission is usually highly acid (p_H as low as 4.6) and shows a brown sediment of acid hematin granules. These are frequently thought to be erythrocytes, a mistake that was made in our first cases. The supernatant urine may be normal in color, and the brown deposit is then sometimes overlooked by inexperienced staff. More usually, however, the supernatant urine is of a smoky color; only in urines with a p_H approaching neutrality is the urine red, and in such urine there is usually little or no sediment. Rarely the first urine obtained is normal: this is seen in very shocked patients and represents urine excreted into the bladder before the burial. With systolic pressures below 70-80 mm. of mercury, little urine is excreted. The pigment in the urine often shows a broad band in the red, signifying a met- compound, as well as two bands in the yellow-green portion closely resembling those of oxyhemoglobin. But, as will be detailed later, the pigment is not hemoglobin. It is always necessary to centrifuge such bloody, benzidine positive urine and to examine the deposit microscopically. If red cells be found, as may happen with rupture of a kidney, it is a mistake to assume that pigment in the supernatant is always derived therefrom. Lysis of such erythrocytes occurs usually only in infected urine. Hemoglobinuria, however, is said to occur with renal infarcts.[17] Within one or two days the excretion of pigment ceases: casts become more numerous, at first consisting mainly of pigment granules, aggregated to form hollow tubes. Later the casts become rather stringy, and toward the end of the first week the pigment core is covered by a layer of desquamated epithelial cells. Sometimes these late casts appear to be entirely cellular. The amount of urine excreted decreases progressively in severe cases until the end of the first week, quantities such as 25-50 cc. in twenty-four hours being passed. Its composition tends to resemble glomerular filtrate in that the concentration of urea is low—often below 1 Gm. per hundred cubic centimeters with a blood level of over 300 mg. per hundred cubic centimeters—and the chloride content tends to be high despite a blood concentration below the normal level. Reducing substances are occasionally found in small amounts. Thus there is evidence of severe tubular dysfunction, although the total output is low rather than high. This we[18] have thought to be due perhaps in some part to mechanical blockage of the tubules but mostly to leakage of filtrate back into the blood stream through damaged tubules. Other substances present in abnormal quantities in the urine are potassium and creatine. Both these substances are derived from damaged muscle, and both occur in largest quantity in the first specimens of urine passed after release.

GENERAL CONDITION

As a result of this excretory impairment, nitrogen retention occurs; the patient becomes rather drowsy, occasionally anxious and apprehensive. Vomiting may occur, another factor tending to reduce the blood chloride level. The serum carbon dioxide combining power may be low soon after release from compression, as the result probably of the liberation of lactic and other acids from the damaged muscle, but rises thereafter; in cases with excretory impairment the carbon dioxide combining power may show a late tendency to fall, as the result of retention of acid. Some patients have undergone laparotomy for abdominal pain without anything definite being found: sometimes pain in the loins is complained of, perhaps because of tension of the renal capsule. The blood pressure progressively rises to levels between 150 and 200 mm. of mercury and is maintained until death or the recovery diuresis ensues. It seems possible that this may be directly related to renal ischemia.

RECOVERY

About one third of the cases ordinarily recognized go on to recovery. These show on the average a smaller volume of necrotic muscle than the fatal cases—one lower leg or part of the lower thigh or one arm involved. The mildest type has no hypotensive phase, although some hemoconcentration can usually be found. The urinary output may remain good throughout, or it may be low for the first day with rapidly increasing volume and urea concentration thereafter: the blood urea level therefore rises only to a limited extent, to 60 or 100 mg. per hundred cubic centimeters on the second day, and then falls to normal. They are left with unimpaired renal function and some slight weakness in the affected muscle. A more severe type, which none the less ultimately goes on to recovery, is not infrequently seen: in these there is oliguria and severely decreased urinary urea concentration, with a blood urea as high as 400-500 mg. per hundred cubic centimeters. At the critical period on the sixth or seventh day a diuresis occurs and is maintained for several days until all the retained nitrogen is excreted. At the same time the raised blood pressure begins to fall to normal. Renal function, however, although it appears to recover completely, does so slowly: and the concentration of urinary urea will rise by about 50 mg. per hundred cubic centimeters daily in the third week. It may take five months for the urea clearance to reach normal figures.[5] Damage to the compressed muscle is never completely repaired if complete ischemic necrosis has occurred. The infarct is replaced by fibrous tissue; calcification sometimes occurs, as in the only English case from the last war that I have been able to find, recorded recently by Albert and Mitchell.[19] With lesser degrees of damage, regeneration of muscle fibers from the sarcolemmal sheath occurs and muscle strength gradually improves. Fibrosis may result in a Volkmann's contracture: it is important, therefore, to splint the limb correctly.

TERMINAL COURSE

Two thirds of the patients die toward the end of the first week, the majority on the sixth day. Death occurs very suddenly and may be preceded by cardiac irregularity. If electrocardiographic tracings are taken, changes similar to those seen in human potassium poisoning are seen—increased T waves and widened QRS complexes. These are associated with an increase of the potassium level in the serum to more than twice the normal upper level of 20 mg. per hundred cubic centimeters. The raised serum potassium concentration

17. Libman, Emanuel, and Fishberg, A. M.: Unilateral Hemoglobinuria Due to Infarct, Ann. Int. Med. **11**: 1344 (Jan.) 1938.
18. Bywaters, E. G. L., and Dible, J. H.: The Renal Lesion in Traumatic Anuria, J. Path. & Bact. **54**: 111 (Jan.) 1942.
19. Albert, Moss, and Mitchell, W. R. D.: Volkmann's Ischemia of the Leg, Lancet **1**: 519 (April 24) 1943.

in crushing injury is due to two processes: first, the muscle potassium diffuses out into the blood stream, its concentration falling from 300 to 70 mg. per hundred cubic centimeters or lower, both in man and in animals; secondly, very little of this is excreted owing to renal failure, and thus it accumulates in the body. The condition is analogous to the toxic condition induced by feeding potassium to dogs with ligated ureters,[20] except that the potassium is endogenous. If insulin and dextrose are given to a patient with raised blood potassium and similar electrocardiographic changes due to obstructive anuria, the blood potassium level will fall and the T waves decrease in height, owing to storage of potassium.[21] This therapeutic lowering of potassium level may be found useful in cases in which there are indications of improving renal function, such as an increasing output and urea concentration (chart 2). It is important, therefore, that these patients should not be given meat or drugs containing potassium salts.

PATHOLOGIC CHANGE IN THE KIDNEYS

The pathologic changes in the kidneys of 22 patients have already been fully described (Bywaters and Dible [18]) and little new has emerged since then regarding structural damage. Briefly the kidneys resemble those of renal failure following intravascular hemolysis, being swollen and tense, with foci of tubular necrosis most pronounced in the boundary zone (distal convoluted tubule) and showing pigmented casts from the distal convoluted tubule downward. Many of these patients had had group O blood transfusions, but they showed no incompatibility, no rigor or post-transfusion backache, no jaundice or abnormal plasma bilirubin concentration (with the exception of a single case described by Longland and Murray [22]) and neither hemoglobin-like pigment nor methemoglobin in their serum.

Some patients had had neither blood nor serum and yet they showed the full picture. We therefore dismissed the possibility of this being due to intravascular hemolysis and found on examining the urine more closely that the pigment differed from hemoglobin in several important respects.[23] Its α band had a wavelength of 5,810 angstroms as compared with hemoglobin at 5,780 angstroms; the CO-span, that is, the shift of the band on converting to carboxyhemoglobin, was only 30 angstroms instead of the 60 angstroms shown by hemoglobin. The pigment, in fact, was myohemoglobin, the intracellular hem- compound responsible for oxygen storage in muscle. Its identification furnished us with a reason for the curious phenomenon of "hemoglobin" appearing in the urine without any being detectable in the blood plasma. Since it has a molecular weight of 16,700 compared with 68,000 for hemoglobin, it filters out through the glomerulus as rapidly as it is taken up from the muscles; it does not accumulate in the blood stream because by virtue of its low threshold, 20 mg. per hundred cubic centimeters (compare with 100 mg. per hundred cubic centimeters for hemoglobin), its renal clearance is twenty-five times as great as that of hemoglobin.[24] Perhaps the best known condition in which this pigment is excreted is paralytic equine myohemoglobinuria: after a period of rest and rich feeding, sudden exercise of the horse produces acute stiffness, swelling and paralysis of muscles, with hemoconcentration, a thready pulse, acidosis and the passage of muscle pigment in the urine. In those animals that die, autopsy shows pale necrotic muscles resembling fish flesh, and an acute nephrosis.[25] Seven cases have occurred in man, and in what was thought to be the eighth case degenerative changes were seen in the muscles, and the kidneys were indistinguishable from those of the crush syndrome.[26]

PATHOLOGIC CHANGES IN THE MUSCLES

The muscles that have been compressed are found at autopsy or operation to be swollen, sometimes pallid, sometimes mottled with hemorrhage. The fibers are friable and opaque. There is a sharp demarcation between living and dead muscle, corresponding with the areas of pressure necrosis in the skin. Histologically the fibers show loss of nuclei and retention of cross striation, with vacuolation and calcification in the boundary zone. Occasionally, however, cases apparently of crush syndrome are seen which show no gross alteration in muscle: in 1 instance (case 1, Bywaters and Beall [27]) in which microscopic examination revealed occasional necrotic fibers in macroscopically normal muscle, we think this patchy necrosis was due to the ischemia of arterial spasm. During life the patient showed several features differentiating the case from the general run of "crush injury"—little hemoconcentration and yet a large decrease in blood pressure, two urine specimens free from protein, and a pulseless leg without progressive swelling. Autopsy revealed hemorrhage in the sheath of the popliteal artery, a lesion known to produce

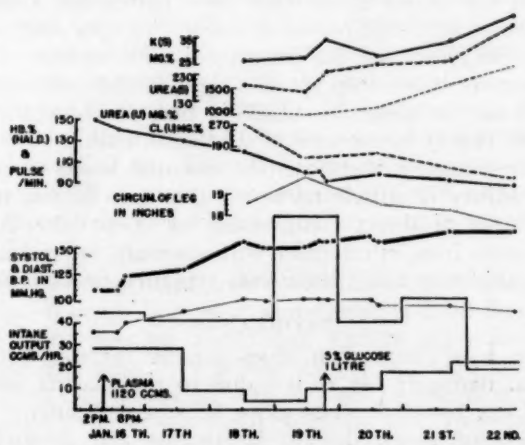

Chart 2.—Course in a man aged 20 buried ten hours (Beall, Bywaters, Belsey and Miles [3]). Note from above down: 1. Biochemical findings (rising serum potassium and urea, rising urinary urea and falling urinary chloride concentration). 2. Hemoconcentration and pulse. 3. Swelling of left leg. 4. Hypertension; no period of hypotension. 5. Intake well maintained. 6. Urinary output recovering. Death occurred on the seventh day with typical postmortem findings.

20. Hoff, H. E.; Smith, P. K., and Winkler, A. W.: The Cause of Death in Experimental Anuria, J. Clin. Investigation **20**: 607 (Nov.) 1941.
21. Unpublished data.
22. Longland, C. J., and Murray, J.: A Case of Recovery from Crush Syndrome, Lancet **2**: 158 (Aug. 9) 1941.
23. Bywaters, E. G. L.; Delory, G. E.; Rimington, Claude, and Smiles, John: Myohemoglobin in the Urine of Air Raid Casualties with Crushing Injury, Biochem. J. **35**: 1164 (Nov.) 1941.
24. Yuile, C. L., and Clark, W. F.: Myohemoglobinuria: Study of Renal Clearance of Myohemoglobin in Dogs, J. Exper. Med. **74**: 197 (Sept.) 1941.
25. Carlström, B.: Skandinav. Arch. f. Physiol. **61**: 161 (March) 1931.
26. Bywaters, E. G. L., and Dible, J. H.: Acute Paralytic Myohemoglobinuria in Man, J. Path. & Bact. **55**: 7 (Jan.) 1943.
27. Bywaters, E. G. L., and Beall, D.: Crush Injuries with Impairment of Renal Function, Brit. M. J. **1**: 427 (March 22) 1941.

violent spasm. In other cases the usual postmortem examination is not extensive enough to reveal muscle necrosis. The importance of finding myohemoglobinuria and creatinuria, therefore, is that these are indirect evidence of severe muscle damage; in all cases showing these substances in the urine a full muscle examination should be made. Cases do occur, however, in which the full crush syndrome picture develops and yet no prolonged pressure has occurred.[5] These are patients, involved often in automobile accidents, with rupture of a main limb artery, with arterial spasm or thrombosis or with obstruction of the main artery by, for instance, a fractured pubic ramus. Each of these causes ischemia of muscle, which, if it lasts for more than several hours, produces muscle necrosis. This necrosis is hastened by the therapeutic warming which such cold pulseless limbs have so often suffered in the past. As soon as the collateral circulation returns to the part, the products of muscle autolysis are swept out into the general circulation and renal failure develops. It seems possible that this condition might occur with embolism of a main limb vessel or after a tourniquet has by mistake been left on for more than three hours, but I do not know of any such recorded cases. Another mechanism thought to account for the necrosis of complete muscles —usually those deep set in a tight fascial compartment such as the posterior tibial, is that of obliteration of blood supply by increase of subfascial tension.[28]

In summary, therefore, the essential lesion of crushing injury is muscle necrosis: this may be due to the ischemia of direct compression or it may be due to ischemia from interference with the main arterial supply by sudden spasm, thrombosis, rupture or obstruction.

PATHOGENESIS

In what way, then, does muscle necrosis produce renal damage? It is not due to the plasma leakage and low blood pressure alone because, in patients with prolonged shock due to lacerations and hemorrhage with a blood pressure below 90 for many hours, we have found no renal damage beyond sometimes a few casts and a temporary trace of albumin. Furthermore, Eggleton and her collaborators[29] have shown in the anesthetized dog that, following the "shock" period after histamine injection, no decrease in creatinine clearance is seen. The chief role in the genesis of renal failure in crush syndrome must therefore be played by substances absorbed from the damaged part.

We have recently analyzed such necrotic muscle from crushing injury; compared with undamaged muscle from the same corpse, it has lost 75 per cent of its pigment, 75 per cent of its phosphorus, 66 per cent of its potassium, 70 per cent of its creatine and 95 per cent of its acid producing substances (glycogen and so on). As has already been detailed, all these substances appear in the first day's urine in increased quantity. Rabbit muscle compressed by rubber tubing for a similar length of time loses all these substances except myohemoglobin within two or three hours after release;[30] that is, as soon as the circulation to the part is reestablished: histologically the muscle shows exactly the same changes as those seen in man. At the same time all the changes characteristic of crush syndrome in man appear (hemoconcentration, hypotension, swollen limb, acidemia and oliguria with acid urine containing creatine) except myohemoglobinuria and renal failure. The rabbit's muscles contain no myohemoglobin: no myohemoglobin was excreted: no renal failure developed. We thought, therefore, that this pigment, of all the substances known to be lost from damaged muscle, ought to be investigated first, not only because of the rather negative results of compressing the rabbit's leg referred to,[31] but because both the clinical course and the pathologic changes in man resembled so closely the results of a mismatched transfusion. The ill effect on the kidney of the latter was thought by Baker and Dodds[32] to be due to the precipitation, in acid urine with high salt concentration, of acid hematin, and subsequent blockage of the tubules: rabbits with alkaline urine could tolerate hemoglobin injections indefinitely. We therefore made good this deficiency of rabbit muscle by injecting human myohemoglobin in quantities per kilogram of body weight comparable with those released in man; in animals with acid urine of a p_H equal to that seen in human beings we were able to produce death after four days in renal failure: the histologic changes in the tense swollen kidney were not, however, exactly similar to those seen in man. While mechanical blockage of the tubules may play a small part, it seems probable from some preliminary experiments that myohemoglobin in these rabbits with acid urine acts in a more direct way on the tubules, perhaps by producing a physiologic (resorption) blockage with a rapid rise in intrarenal pressure. It is far from certain, however, that this lesion is the same as that seen in man. In the anesthetized dog, whose muscles contain myohemoglobin, Eggleton, Richardson, Schild and Winton[29] are of the opinion that the depression in creatinine clearance which follows tight binding of the limb for five hours with additional crushing and hammering is not in any way due to blockage. Their experimental procedure produced flaccid kidneys, whereas, if blockage or tubular poisoning was involved, tense swollen kidneys should be found. They noted also that this depressed creatinine clearance could not be prevented by preliminary bicarbonate infusion. They conclude that disturbance of no single mechanism could account for all the observed phenomena. A further interesting observation has recently been made by Eggleton,[33] using the anesthetized cat. Employing a technic similar to that we used in the rabbit, she found that following release of the compression the creatinine clearance fell 50 per cent, while if the circulation was readmitted slowly to such ischemic limbs there was no change. Later experiments suggest that the liver, given time, was able to detoxicate the blood returning from the damaged area. Again, it is not yet certain that this renal damage produced in cats and dogs is the same as in man, since in the latter the criteria are clinical, whereas in these acute animal experiments no data on recovery have yet been obtained: the criterion has been chiefly that of creatinine clearance.

28. S. L., and G. K. R.: A Case of the Crush Syndrome with Recovery, London Hosp. Gaz. **44**: 126 (June) 1941.
29. Eggleton, M. Grace; Richardson, K. C.; Schild, H. O., and Winton, F. R.: Renal Damage Due to Crush Injury and Ischemia of the Limbs of the Anesthetized Dog, Quart. J. Exper. Physiol. **32**: 89, 1943.
30. Bywaters and Stead: unpublished data.
31. Bywaters, E. G. L., and Popjak, G.: Experimental Crushing Injury, Surg., Gynec. & Obst. **75**: 612 (Nov.) 1942.
32. Baker, S. L., and Dodds, E. C.: Obstruction of Renal Tubules During Excretion of Hemoglobin, Brit. J. Exper. Path. **6**: 247 (Oct.) 1925.
33. Eggleton, M. Grace: Crush Syndrome, Brit. M. J. **2**:495 (Oct. 24) 1942.

DIFFERENTIAL DIAGNOSIS

It must be remembered that injuries may often be multiple: "blast lung," "fat embolism" and cardiac infarction are complications we have seen which confuse the issue. We have recently seen hemoglobin concentration of 19.8 Gm. per hundred cubic centimeters in a man buried for twenty-four hours resulting from paralytic ileus from pressure of a truss pad, without any gross muscle necrosis. Oliguria due to mismatched blood transfusion, oligemic hypotension and crystal calculi must be differentiated. Hematuria and hemoglobin may be differentiated by examination of the urine.

TREATMENT

Treatment is to be considered under four headings:

1. *Administration of Fluid and Alkali.*—The first and most urgent step is an attempt to guard against renal failure by the establishment of an alkaline diuresis. Instructions should be issued to civil defense personnel to give sodium bicarbonate by mouth and nonmilky fluids such as tea, coffee and water if possible before release from compression of patients buried for one to two hours or more: if necessary, release should be delayed for twenty to thirty minutes to allow this to be done. Patients so treated should wear an identifying label and be followed with especial care. It seems probable, however, that most patients will not have had this alkali and fluid given before they enter the hospital. They should be given sodium bicarbonate or other mild alkali 4 Gm. hourly by mouth until the urine is alkaline. Dosage should then be continued over the next two days, to maintain alkalinity, at a rate of about 30 Gm. a day. Should vomiting preclude oral administration or if it is desired to alkalize the urine within two hours, 1 liter of isotonic sodium lactate (one-sixth molar = 2 Gm. per hundred cubic centimeters) should be given intravenously. This may be made up in small bottles of 50 cc. in tenfold strength (20 Gm. per hundred cubic centimeters) and diluted ten times before use. (It keeps well and can be sterilized by boiling or autoclaving.) If this is not available, 3 to 4 per cent sodium citrate may be given but has the disadvantage in large amounts of producing tetany. Sodium bicarbonate (1.4 per cent) may also be given intravenously, but, as this will decompose on heating in the open, sterilization is difficult: in an emergency a measured amount may be dissolved in sterile water (2 teaspoons to a pint) and injected without sterilization. It must be emphasized that this alkalization to be effective should be early and thorough, being controlled by the reaction of the urine. If possible it should precede measures taken to improve the circulation in the injured part. A fluid intake of at least 3 liters daily should be assured, either by mouth or by vein. The volume of the urine must be measured over twenty-four hours.

2. *Treatment of "Shock."*—This should follow hydration and alkalization. The patient may be leaking plasma into the injured area, sometimes without outward sign if the trunk is affected. This may pass on to "oligemic shock," although the blood pressure remains normal for a time because of vasoconstriction. Since renal function is likely to be further impaired by a fall in blood pressure, it is important that this "preshock" stage should be recognized and prompt treatment instituted. Serum or plasma should be given before the blood pressure falls—in the stage of hemoconcentration. Blood may be necessary if more than 2 liters of fluid has to be used or if hemorrhage has occurred. Morphine should be given for pain. The patient should not be heated, unless he is uncomfortably cold, and then blankets will probably be sufficient.

3. *Local Treatment.*—The injured limb should be kept cool with ice bags, as this will decrease the rate of autolysis and also allow living tissue to survive on a low margin of blood supply.[34] Immobilization may prove a useful measure, since absorption of large moleculed substances occurs chiefly by way of the lymphatics. If circulatory obstruction should occur, fascia splitting incisions may be made along the course of the main limb vessels, once the urine is alkaline. Plaster casts may be applied after splitting the fascia but not before (unless they are bivalved): a closed cast may prove a more dangerous constricting agent than a tight fascial sheath. If obstruction is due to spasm, this may be relieved by stripping or resection of the damaged portion of the vessel.[35] Amputation should be done only if the leg is so severely damaged as to be useless and then in the first twenty-four hours. The value of tight bandaging is uncertain: while it will decrease the severity of shock by limiting fluid loss (Duncan and Blalock,[36] Katz [15]) observations have yet to be made of its effect both on the kidneys and on the residual local lesions. Later, splinting will be necessary in the optimal position; physical therapy and occupational therapy will have an important part to play in the recovery of function.

4. *The Treatment of Cases with Established Renal Failure.*—If renal damage is well established, all therapeutic efforts may be unavailing. On the other hand, some patients with very severe lesions and high blood urea levels (e. g. up to 490 mg. per hundred cubic centimeters) have recovered without any treatment other than bed rest. The results of any particular treatment must therefore be viewed with a critical eye. The use of diuretics such as sodium bicarbonate and concentrated serum may be of value. Mercurial diuretics have also been used, and decapsulation has been advocated. Insulin and dextrose may prove to be of value in some cases.

In conclusion, very little is yet known about the effects of therapy. The evaluation of treatment depends on the ability to forecast the outcome without treatment, and that is often difficult, even with the complete investigation possible in research centers. Further work is needed, both from the experimental laboratory and, using suggestions derived therefrom, in man. For this, that very full collaboration between physician, surgeon and pathologist is needed which, on a larger scale, between freedom loving nations, is beginning to emerge as one of the few happy developments of these unhappy times.

Hammersmith Hospital L. C. C., Ducane Road, Shepherd's Bush, London, W. 12.

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INJURIES TO THE KIDNEY

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LOS ANGELES

Injuries to the kidney vary from mild contusions to complete maceration of the entire renal mass. The majority occur in men, owing not only to greater exposure and more strenuous physical activity but also to the more inflexible muscular fixation of the kidney.

Injuries to the kidney are divided into open, or penetrating, and closed, or nonpenetrating, wounds. During peacetime the majority of renal injuries are of the closed type, occurring in civilians and resulting from traffic and industrial accidents and not infrequently from vigorous athletic activity, particularly football. Usually these injuries are slight, causing some pain and hematuria and requiring only expectant treatment. In wartime the incidence of penetrating wounds increases, and these are mainly gunshot injuries, due either to rifle bullets or to shrapnel. Apparently the location and protective covering of the kidneys prevent them from being injured by other types of war wounds, such as air and immersion blast injuries. In blast injuries, usually the lungs and hollow viscera alone are affected, the kidneys and other solid organs rarely being damaged.

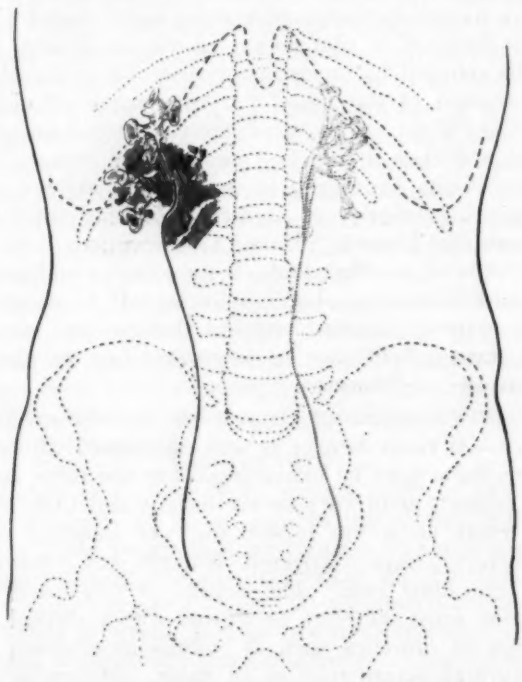

Fig. 1.—Extensive tear of the renal pelvis following efforts to extract a stone impacted at the ureteropelvic juncture.

Recent advances in urologic diagnosis, use of the newer urinary antiseptics and more conservative surgical procedures have all reduced the seriousness of both types of renal injuries and the incidence of both early and late complications and sequelae.

PATHOLOGY

Closed injuries to the kidney vary from a slight subcapsular hemorrhage to complete destruction of the parenchyma with or without injury to the hilus. The most common lesion is a tear through the capsule with mild injury to the parenchyma, usually causing only moderate pain and hematuria and rarely necessitating surgical treatment. Patients requiring surgical intervention generally have rather extensive damage with multiple fissures of the parenchyma which may at times completely fragment the kidney. The blood vessels are always torn, bleeding is free and perirenal hematomas are common. On surgical exploration, the most striking feature is the large amount of clotted and free blood surrounding the renal mass. If the capsule is not torn, the bleeding may cause only a localized subcapsular hemorrhage. In some cases one pole, or both, is torn from the kidney, or the kidney may be divided by a deep fissure which opens directly into the pelvis. Extensive parenchymal tears usually follow a transverse line of cleavage which opens up between the large tubules and vessels. If the fissure involves only the parenchyma, rarely will urine be found in the wound, but if it extends into the pelvis or calices, extravasation of urine usually occurs. If the injury is slight and the urinary extravasation small, the urine may be absorbed or it may form a perinephric abscess with extensive adhesions and matting of the perirenal tissues. In patients without infection and with intact perirenal tissues, pseudohydronephrosis may result.

Rupture of the renal pelvis occurs occasionally during instrumental urologic manipulations, most commonly during efforts to manipulate calculi either in the pelvis or in the upper part of the ureter. Occasionally very extensive tears of the pelvis may result from vigorous attempts to deliver a rigid instrument with its attached stone. In 1 case, at surgical exploration of the kidney several days after such an accident, two fingers could readily be passed into the renal pelvis (fig. 1). In such injuries to the pelvis and ureter, urinary extravasation spreads rapidly, and unless early exploration is carried out, infection, edema and adhesions make any conservative procedure impossible.

Perforation of the renal pelvis or renal parenchyma may result from the use of stiff or styleted ureteral catheters. Fortunately such accidents, which possibly are not always recognized, rarely cause permanent damage.

Nontraumatic, or spontaneous, rupture of the kidney is extremely rare. In most reported cases it has occurred in diseased kidneys. Infection, chronic nephritis and hydronephrosis are the most frequently associated conditions. Henline [1] was able to collect only 24 cases from the literature and reported 1 case of his own of a spontaneous rupture resulting in a perinephric abscess which burrowed down to the perineum. In some cases the trauma is so slight as to be overlooked or not considered a factor in the rupture of the kidney.

Penetrating injuries, whether caused by gunshot or stab wounds, rarely affect only the kidney; usually the renal injury is of minor importance, being not infrequently overlooked. The most common penetrating wounds of the renal parenchyma are of the perforating type, although furrows, complete destruction of either pole or extensive shattering of the kidney may occur. In penetrating injuries, as with closed lesions, parenchymal wounds may be slight, especially those in which the edges or poles are damaged. When the center of the kidney is injured, the damage is usually severe.

This paper, in a symposium on "War Injuries," is published under the auspices of the Section on Urology.

1. Henline, Roy Biggs: Spontaneous Rupture of the Kidney, J. A. M. A. **83**: 1411-1414 (Nov. 1) 1924.

The nature of the projectile has little particular effect on the injury, although bullet wounds destroy a portion of parenchyma only slightly larger than the size of the bullet, whereas shrapnel makes a more irregular wound, with greater destruction of tissue. In shrapnel injuries the edges of the wound are more likely to be contused, and the adjacent parenchyma may become necrotic on account of arterial injury.

In wounds involving the hilus, the renal artery or one of its larger branches may be divided. When the renal artery has been severed the patient usually dies before reaching the hospital; when one of the larger branches has been cut through or obstructed by formation of a clot, nephrectomy is usually resorted to. Although renal veins anastomose, the arteries do not, and consequently arterial injury, even of the smaller vessels, may cause extensive cortical necrosis. In an occasional case the renal vessels are divided, leaving an intact ureter. The renal pelvis and the renal artery and veins are infrequently injured, though they may be injured by the same missile.

SYMPTOMS AND DIAGNOSIS

Hematuria, pain and abdominal rigidity are present in most cases. The location of the wound and the presence of hematuria are usually the first indications of renal damage in penetrating wounds.

Pain and Abdominal Rigidity.—In slight injuries only tenderness may be present, but in the majority of cases pain is present, varying in degree from a constant discomfort to severe and agonizing colic, which usually increases on movement. Like renal colic from any cause, the pain may radiate to the groin or into the thigh. Pain is due to injury to the soft parts, distention of the renal capsule or passage of blood clots down the ureter. Rupture or tear of the renal pelvis, particularly in cases of instrumental injury, causes a sudden, sharp onset of severe pain. There are partial fixation and rigidity of the abdominal wall and tenderness on abdominal palpation over the injured kidney and in the corresponding costovertebral region. Rarely is abdominal relaxation sufficient to permit accurate palpation of the renal region, although in some cases extensive perirenal bleeding produces a large mass in the flank which is readily felt through the rigid muscular wall. When the abdomen has been perforated by a bullet wound, extensive abdominal rigidity is usually present, although either partial or generalized abdominal rigidity does not always mean a lesion of the peritoneal cavity. Gunshot wounds of the chest or chest wall, extensive hematoma of the renal region or intra-abdominal hemorrhage from any condition also can cause abdominal rigidity.

Shock.—Usually, though not always, shock is present. In uncomplicated cases it is generally not severe and depends to a certain extent on the amount of blood lost. Fear, exposure and delay greatly increase the incidence of shock in war injuries. Shock developing after several days usually means either increased or recurrent bleeding. In cases in which an injury to the abdominal viscera, thorax or spinal column is associated, shock usually is severe. Even in uncomplicated renal injuries, however, the severity of shock is not always an accurate index of the degree of renal damage.

Hemorrhage.—Bleeding is the most serious complication, usually involving the kidney and perirenal tissues. In some cases the bleeding is extensive, forming a massive perirenal hematuria. The bleeding has a tendency to cease spontaneously, possibly owing to increased pressure in the restricted perirenal space. An associated rupture of the peritoneum permits the blood and urine to drain from the closed lumbar space into the peritoneal cavity; occasionally large amounts of blood and clots must be removed from the peritoneal cavity at the time of renal repair.

Hematuria.—Varying from microscopic amounts to massive hemorrhage, blood is present in the urine in most cases, although the hematuria may not occur immediately. In the early stages it is not excessive, and after several days it tends to cease spontaneously. If the wound involves only the parenchyma of the kidney, hematuria may be slight or absent.

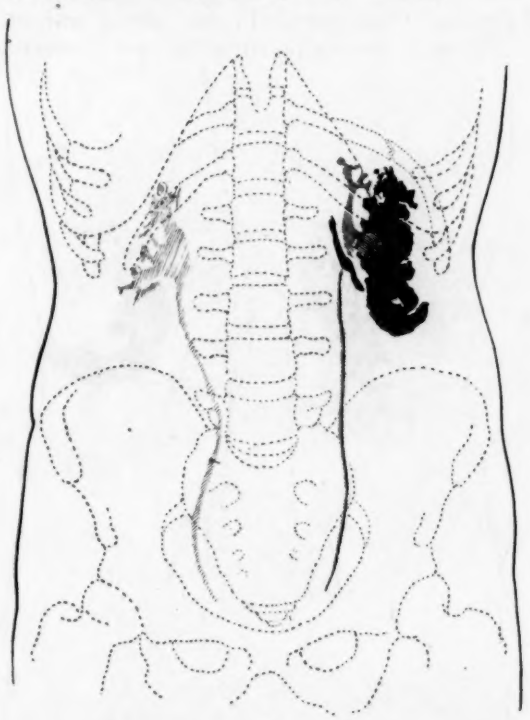

Fig. 2.—Complete pulpefaction of the kidney associated with rupture of the spleen and tear of the peritoneum.

It is necessary to make certain that the blood is coming from the kidney and not from the bladder, as the blood coming from the latter is a not infrequent manifestation of associated injury of the spinal cord, particularly in cases of gunshot injury. In all cases of wounds of the flank, the urine should be examined for microscopic evidence of blood. If necessary, catheterization should be done, as retention is common in cases of renal injury and may be due to a concomitant lesion of the spinal cord. Absence of hematuria may be due to division of the ureter, to obstruction of it by clots or fragments of renal tissue or to extensive damage to the renal pelvis.

Secondary hemorrhage into the bladder is fairly frequent and is most common in the second or third week after injury but may appear as late as two months afterward. It is not unusual for late hemorrhages to be so severe that they cause death. Consequently it is desirable, even in cases in which only slight renal injury is present, to keep the patient absolutely quiet,

preferably at rest in bed, for at least two weeks after injury. Secondary hemorrhage may be spontaneous or it may be an exacerbation of persistent primary hemorrhage. Differing from the primary bleeding, it may be accompanied by clotting of blood in the bladder.

Urography.—Roentgenographic examination gives definite diagnostic information relative to the state of the kidney and the possibility of associated bony lesions and should be made as soon as the patient reaches the hospital, as gas distention develops quickly and obscures the renal outline. A plain roentgenogram of the kidney may be taken in the presence of extensive secondary injuries which prohibit more detailed urologic studies. Haziness of the renal outline, obliteration of the margin of the psoas muscle or deviation of the spine away from the injury suggests perirenal bleeding (fig. 2).

Excretory Urography.—In the case of war injuries there rarely is time or opportunity for excretory urography in the first few days after trauma, but when possible it is of great assistance. Intravenous urography aids in locating and defining the extent of the injury and determines the presence and function of the opposite kidney. While the incidence of single kidneys is low, the possibility should be considered in all cases. Turton and Williamson [2] reported 1 case of traumatic rupture of a single kidney and collected 4 more from the literature; the right kidney was absent in all the cases. If a fair concentration of the opaque medium is excreted by the injured kidney, it is probable that the renal injury is slight and early treatment unnecessary.

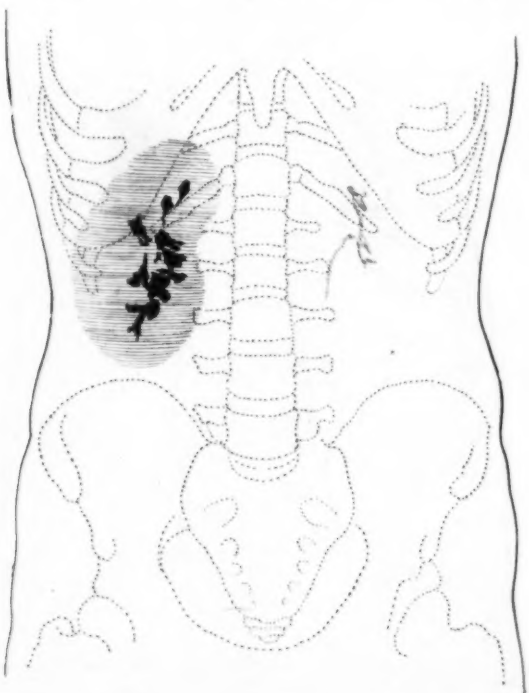

Fig. 3.—Intravenous urogram, showing multiple extensive tears of the parenchyma of the right kidney.

Excretory urograms, similar to plain roentgenograms, can be made in the presence of extensive complications and even when the patient is unconscious (fig. 3). They have the disadvantage that the secretory powers of the kidney may be inhibited or reduced by trauma and that in the presence of shock the ability of the kidney to secrete is reduced still further by a drop in blood pressure and lowered volume of blood to the kidney. During the period of recovery the secretory power of the damaged kidney as well as that of the sound, contralateral organ is inferior to the immediate post-traumatic ability to secrete. Domrich [3] has shown that the secretion of the kidney continues after trauma as long as the tissue and renal blood supply are intact but that during recovery secretion of a traumatized and intact kidney is less than that observed immediately after trauma. Therefore in most cases excretory urography performed shortly after rupture gives the most reliable information concerning the gravity of the lesion. There are cases, however, in which early excretory ureteropyelograms are unsatisfactory and in which better results may be obtained twenty-four to forty-eight hours later.

Excretory urography is particularly graphic in cases of minor injury to the kidney and is usually of more diagnostic assistance in cases of gunshot wounds than in cases of rupture from civilian trauma, as gunshot wounds frequently leave a large proportion of the kidney undamaged. In some instances of even fairly extensive tears, sufficient opaque solution is secreted by the remaining normal segment of parenchyma to indicate the extent of damage present.

Prather [4] states that lack of visualization of the injured kidney in an intravenous urogram is important and indicates the presence of a pathologic process requiring surgical exploration. By contrast, visualization of the injured organ does not rule out injury. Stirling and Lands [5] were able to make a positive diagnosis by means of an intravenous urogram in 23 of 34 cases studied. A retrograde pyelogram was necessary in only 7 of their cases.

Cystoscopy, Ureteral Catheterization and Retrograde Pyelography.—Sometimes these may be necessary to establish the diagnosis, and usually they give much more accurate information than that obtained by excretory urograms. However, in the case of war injuries lack of time or equipment usually prohibits these procedures in the early days after injury. Moreover, cystoscopy is usually hazardous in the presence of shock or extensive bony lesions. Exacerbation or recurrence of bleeding may follow shifting of the patient's position or, more rarely, instrumental manipulations. When cystoscopy is indicated and can be carried out, and time and the condition of the patient permit, it should be done.

Retrograde pyelography offers definite, accurate information concerning the condition of both the injured and the opposite kidney (fig. 4). The risk of infection resulting from cystoscopy is slight, and no harm comes from injecting the newer, absorbable contrast solutions. On the other hand, cystoscopy is rarely necessary in cases with slight trauma and minimal bleeding.

In the majority of cases of gunshot wounds, particularly those encountered in the front line hospitals, the

2. Turton, J. R. H., and Williamson, J. C. F. L.: Traumatic Rupture of the Congenital Solitary Kidney, Brit. J. Surg. **23**: 327 (Oct.) 1935.

3. Domrich, H.: Versuche über die Funktion verletzter Nieren, Ztschr. f. Urol. **32**: 78-90 (Feb.) 1938.

4. Prather, George C.: Traumatic Conditions of the Kidney, J. A. M. A. **114**: 207-210 (Jan. 20) 1940.

5. Stirling, W. C., and Lands, A. M.: Etude expérimentale des facteurs secondaires aux traumatismes des reins, J. d'urol. **43**: 304-312 (April) 1937.

finer points of diagnosis obtainable by cystoscopy are time consuming and unnecessary. The only immediate questions to be settled are Is operative intervention imperative? and Is the opposite kidney capable of sustaining life in the event that nephrectomy is obligatory? The intravenous urogram usually gives a satisfactory answer to both of these questions. With penetrating injuries the physical findings, site of entrance of the projectile, pain, swelling and hematuria generally determine the diagnosis and the location of the lesion. With closed wounds the history of trauma and persistent pain and hematuria suggest the need for further investigation.

In those cases in which satisfactory ureteropyelograms are obtained, the visualized changes in the course of the ureter and the outline of the renal pelvis give accurate information concerning the pathologic changes present. Deviation of the ureteral outline toward the vertebral column, upward displacement of the ureteropelvic juncture and narrowing of the calices suggest perirenal extravasation.

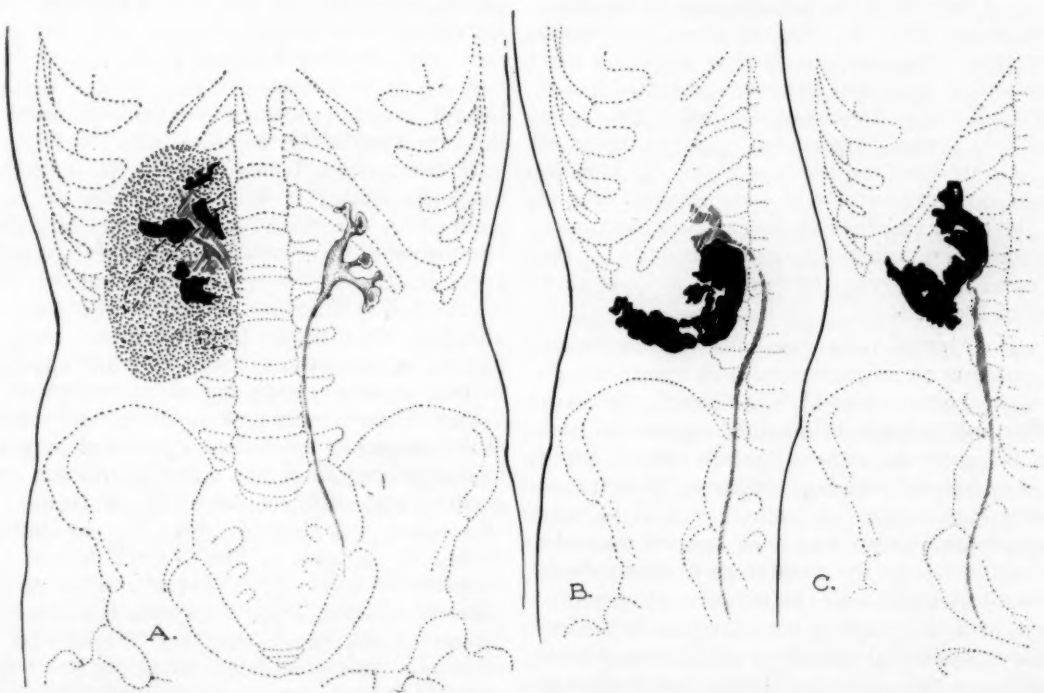

Fig. 4.—Rupture of the right kidney. *A* shows a large hematoma extending from the costal margin to the crest of the ilium. *B*, taken two weeks later, shows the palpable mass to be much smaller, with extension of the shadowgraphic substance around the lower pole of the kidney. *C*, a pyelogram taken two months after injury, showing the renal mass to be approximately normal in size. (Case of Dr. C. F. Rusche.)

TREATMENT

In many cases, particularly of penetrating injuries, care of the renal condition is less urgent than that of complicating lesions, and in a large number only conservative local treatment is necessary. Palliative treatment is sufficient and yields good results in the majority of both open and closed types of injuries, but bed rest is essential, and careful observations should be made of the extent of hematuria, of the amount of pain and for evidence of hemorrhage and infection. Early return to routine life may cause serious trouble. Two of my patients, football players with mild renal injury, returned to active life after only a few days rest; one had an extensive secondary hemorrhage, the other a severe urinary infection which was still present one year later. Three patients with minor renal injury, as reported by O'Conor,[6] resumed their active life a short time after injury, and all 3 later had massive hemorrhage which required surgical intervention.

The main point to be settled regarding any renal injury, penetrating or nonpenetrating, is whether exploration is necessary and, if so, when. Some surgeons state that patients having a history of trauma and hematuria of more than twenty-four hours' duration should have exploration. Others favor a policy of watchful waiting. Lowsley and Menning[7] declared that any patient who has a history of trauma and who has had hematuria for more than twenty-four hours should have the benefit of an exploratory operation. They state that such a procedure is now considered to be more conservative than hopeful waiting. When there are signs of internal hemorrhage, such as a rising pulse rate and a falling blood pressure, immediate operation may be necessary, but in the average case little is lost by a period of observant waiting. This delay allows the patient time to recover from shock; the necessary diagnostic examinations may be carried out and, if exploration is finally necessary, surgical hemorrhage is usually less in amount than it would have been immediately after injury. The final decision as to whether to explore the renal area depends on the surgeon, and it varies in individual cases. Continuous hematuria and signs of infection or of internal hemorrhage all indicate that extensive damage is present and that exploration is necessary. Sometimes, even though

6. O'Conor, Vincent J.: Injuries of the Kidney with Remarks on the Effects of Trauma in General on Urinary Infection and Stone Formation, Illinois M. J. **69**: 541-544 (June) 1936.

7. Lowsley, O. S., and Menning, J. H.: Treatment of Rupture of the Kidney, J. Urol. **45**: 253-271 (March) 1941.

the patient has recovered from the immediate effects of the injury, some surgical procedure may be necessary to prevent later complications or even complete destruction of the kidney.

Shock, common with war wounds, is rare with uncomplicated renal injuries and should be treated symptomatically. When it is due to renal bleeding, exploration of the kidney is indicated. Hematuria, even though pronounced, is not sufficient reason for early surgical exploration. Primary hematuria usually subsides in twenty-four to forty-eight hours, but if it persists and is profuse the kidney should be explored. Urinary extravasation usually calls for early and extensive incision and free drainage of the region.

In cases of a penetrative wound or a closed wound with extensive trauma in which it is doubtful whether the abdomen or the renal region should be opened, one should remember that lumbar incision carries less risk, and that, if necessary, the abdomen can be explored through the same incision. The renal region should be explored first. An adequate lumbar approach permits evacuation of clots and thorough visualization of the kidney and opens an easily drained region that may be securely packed if necessary. After repair of the kidney is completed the lower angle of the incision may be elongated transversely, the peritoneum opened in front of the colon and the adjacent viscera examined. This is especially important in gunshot wounds, as the peritoneum and its contents are damaged in more than 90 per cent of the cases.

Abdominal Approach.—In cases in which primary abdominal exploration is performed and renal damage is probable, the kidneys should be palpated. In some cases positive information is obtained by use of this route, but, if injury is present, usually an obscured field due to perirenal bleeding makes it difficult to determine the extent of renal damage even if the posterior layer of peritoneum has been opened over the kidney. Exploration of the renal region transabdominally is usually not advisable, as it opens up a poorly drained field, which is readily contaminated from frequently present abdominal infections. If during abdominal exploration a hematoma or obvious renal damage is found, it is unwise to open the posterior portion of the peritoneum for either further exploration or evacuation of clots. For the same reason transabdominal nephrectomy is particularly hazardous, bears a high mortality record and should rarely be done. Many fairly large perirenal hematomas do not need immediate evacuation. Although they may eventually cause further renal damage and disability, no harm results from delaying their removal until opportunity and the state of the patient make this procedure safe.

When conditions found during the course of laparotomy indicate that exploration of the renal fossa is necessary, a second incision should be made, with the lumbar approach. It is, however, preferable to postpone renewed intervention for several days. On the other hand, early exploration is imperative in cases in which bleeding from the kidney is excessive, although it may have incited considerable shock.

Wounds of Kidney, Liver and Diaphragm Combined.—Combined wounds of the kidney and liver, although serious, usually require only conservative management, and frequently surgical intervention is neither advisable nor necessary. Wounds of the diaphragm encountered in the course of exploration of the kidney rarely require repair.

Surgical Procedures for Wounds of Kidney.—In the treatment of wounds of the kidney there are three possible surgical procedures: (1) drainage of the renal region, (2) partial nephrectomy and repair of the injured kidney and (3) nephrectomy.

Drainage of Renal Region: This is the most satisfactory procedure in cases of penetrating wounds, especially when shock is present and exploration urgent. It permits inspection, evacuation of blood clots and control of bleeding. It is the simplest procedure and may be done quickly with only slight risk to the patient. Foreign bodies and fragments of shrapnel should be searched for carefully and removed. All loose fragments of tissue should be taken out. Drainage should be free and plentiful. The drains should be placed carefully to reach all parts of the wound. In closing the incision one should take care not to suture so tightly that obstruction of drainage results.

Drainage is indicated if time or the condition of the patient has not permitted complete studies to determine the condition of the opposite kidney.

If hemorrhage is encountered, an effort should be made to control it with catgut ties or sutures. In suturing or clamping bleeding points one should exercise care not to injure the peritoneal contents or the great vessels; on the right side the duodenum lies close to the kidney and is easily damaged. No large segments of tissue should be grasped with toothed forceps, and no extensive or deep suturing should be done without certain knowledge of the involved structures. Usually general oozing does not permit complete localized hemostasis and is best controlled by packing with iodoform or plain gauze. Lumbar incision permits firm packing, and sufficient gauze should be used to control all bleeding. A piece of rubber dam or similar material should be spread in the wound before packing to facilitate removal of the gauze and to prevent recurrence of bleeding when the gauze is taken out. When lacerations of the kidney are severe and when the patient is in a precarious condition, thorough packing controls the hemorrhage until the patient is better able to stand nephrectomy.

When the kidney is not removed and drainage is installed, it should be continued until at least the tenth postoperative day.

Partial Nephrectomy, Renal Repair and Plastic Operations: These procedures frequently are employed with satisfactory results for closed, uninfected, civilian types of renal rupture but usually are unsatisfactory for infected, penetrative wounds. Many injuries for which a plastic operation would be sufficient and satisfactory will heal without surgical intervention. Extensive plastic procedures following widespread destruction of the kidney not uncommonly result in a functionless kidney. When partial nephrectomy or suture has been done, parenchymal infection, necrosis and late bleeding may necessitate reopening the wound later and, in some cases, secondary nephrectomy.

The control of hemorrhage usually calls for surgical intervention. A partial nephrectomy is not likely to remove the cause of the bleeding, and a patient already anemic should not be exposed to the risk of a fresh hemorrhage from a sutured or a partly resected organ.

Rarely are limited operations justifiable in the treatment of penetrative wounds.

Nephrectomy: The kidney should be removed in cases of persistent hematuria, multiple deep lacerations of the parenchyma or damage to the vascular pedicle. A patient who has rupture involving the entire vascular pedicle rarely reaches the operating table in a condition suitable for operation.

When the ureter is severed, the pelvis torn or the kidney lacerated and urine is escaping from the wound, results are usually poor unless nephrectomy is done. However, in the presence of a ureteropelvic tear, slight or no infection and a sound kidney, no harm results from the flow of urine over tissues as long as it has a free exit.

Nephrectomy is a simpler procedure than most conservative or repair operations and usually removes the cause of bleeding. In the small group of cases in which the condition of the patient is satisfactory and the kidney so damaged that ultimate nephrectomy will be necessary, or there is uncontrollable bleeding from the kidney, nephrectomy is the procedure of choice. Nephrectomy takes less time than a repair, removes a potential field for infection and limits future bleeding from the operative site. It also eliminates a secondary operation and the late disability and sequelae which so frequently follow reparative procedures.

In the early days after injury nephrectomy is difficult and hazardous. Most observers agree that in only rare instances is early nephrectomy indicated or advisable. Increased experience has shown that in many cases, particularly of gunshot wounds, in which early nephrectomy would formerly have been employed, better results are obtained by efficient drainage; nephrectomy, if it is necessary, is left until a later date.

LATE RESULTS

Patients who have nephrectomy for an injured kidney usually obtain good results and are able to lead a normal life. On the other hand, complications are frequent in patients treated medically and by conservative surgical measures. Pyelonephritis, urinary fistula, hydronephrosis, ureteral stricture and stone formation not uncommonly occur. Infection is common in untreated patients, at times persisting for years. Perinephric abscess, which occasionally develops, may be drained, leaving the kidney intact.

Dózsa [8] reported 83 cases of injury to the kidney. Conservative treatment was satisfactory in 79 and operation was performed in 3. Twenty-seven of the patients were seen from six months to thirty years after the initial injury and had to be operated on for probable consequences of the renal injury. Hydronephrosis was present in 6, renal stone in 9 and tuberculosis of the kidney in 10. Priestley and Pilcher [9] reported a series of 45 cases of ruptured kidneys, 31 of which they were able to follow for periods ranging from four to twenty-six years after injury. Eleven patients who underwent nephrectomy were entirely free of symptoms, 73.7 per cent of those treated medically were entirely well and the remainder of the group had mild symptoms referable to the urinary tract. Cheetham [10] reported a series of 25 cases of so-called late complications seen at various periods after renal injury. All gave a definite history of renal trauma. Three of the 25 were treated medically, but some type of operation was necessary for the remaining 22.

Colston and Baker [11] presented a series of 13 cases in which definite pathologic changes in the kidney or perirenal tissue had occurred at varying periods after renal injury. While not condemning conservative treatment of renal injuries, these authors stated that the surgeon must be familiar with the changes that may follow injury and take steps to prevent their development. They said that some of the serious effects might have been prevented by better and earlier surgical methods.

MORTALITY

Collected statistics on renal operations, most of which were published shortly after the turn of the century, suggested that the mortality following renal trauma, whatever the treatment, was high. These statistics were usually based on small groups of cases in which treatment had been carried out in the formative days of renal surgery. Many of the injuries were not recognized early, some milder injuries were overlooked and operation when performed was carried out during a period when any surgical approach to the kidney was attended by a high mortality. These early statistical reports, still quoted by recent textbooks on renal operations, are not comparable to those obtainable with modern accurate diagnostic measures, skilful parenchyma conserving plastic procedures and efficient, universally employed, urinary antiseptics. There was no mortality in a series of 43 cases reported by Cheetham,[10] in 31 of which operation was performed, and there were only 2 deaths, both attributed to severe extrarenal trauma, in a series of 45 cases reported by Priestley and Pilcher.[9]

On the other hand, the mortality is high in complicated cases. Hinman [12] stated that injury of the kidney complicating extensive involvement of certain internal organs becomes a part of the general abdominal problem. Twenty-seven of Hinman's group of 137 cases of renal injury were of this type, and all 27 patients died shortly after admission to the hospital.

Statistical reports from different countries vary widely with regard to the incidence and mortality of war injuries, but agreement is general concerning the rarity of uncomplicated renal lesions and the high mortality in complicated cases. Laewen [13] collected and reported a group of 57 cases of gunshot wounds through the abdomen and kidney treated in German hospitals; there were only 5 cures, giving a mortality of 87.7 per cent. The results of treatment in British war hospitals are more encouraging. The reports of Wallace,[14] Lockwood and his co-workers,[15] Fraser and

8. Dózsa, Eugen: Ueber die subcutanen Nierenverletzungen und deren Spätfolgen, Ztschr. f. urol. Chir. u. Gynäk. **42**: 222-230 (May) 1936.

9. Priestley, J. T., and Pilcher, F., Jr.: Traumatic Lesions of the Kidney, Am. J. Surg. **40**: 357-364 (May) 1938.

10. Cheetham, J. G.: The Clinical Management of Renal Trauma: Collective Review, Surg., Gynec. & Obst. **72**: 573-584 (June) 1941.

11. Colston, J. A. C., and Baker, W. W.: Late Effects of Various Types of Trauma to the Kidney, Tr. Am. A. Genito-Urin. Surgeons **28**: 171, (June) 1935.

12. Hinman, Frank: Principles and Practice of Urology, Philadelphia, W. B. Saunders Company, 1935.

13. Laewen: Quoted by Straus, David C.: Recent Gunshot Wounds of the Kidney, S. Clin. North America **2**: 635-681 (June) 1922.

14. Wallace, Cuthbert: A Study of 1,200 Cases of Gunshot Wounds of the Abdomen, Brit. J. Surg. **4**: 679-743 (No. 16) 1917.

15. Lockwood, A. L., Kennedy, C. M., and Macfie, R. B.: Observations on the Treatment of Gunshot Wounds of the Abdomen with a Summary of 500 Cases Seen in an Advanced Casualty Clearing Station, Brit. M. J. **1**: 317-320 (March 10) 1917.

Drummond [16] and Walters and his associates,[17] published in 1917 and later reviewed by Young for the Surgeon General's report, covered a series of 2,121 cases of gunshot wounds of the abdomen. The kidney was involved in 155 (7.3 per cent) of these cases; 57 per cent of the patients died. For 69 uncomplicated wounds of the kidney the mortality was only 14 per cent. In the American Expeditionary Forces the kidney was involved in 129 of 2,385 cases (5.44 per cent) of gunshot wound of the abdomen. The mortality rate in this group, for both complicated and uncomplicated cases, was 55.8 per cent.

SUMMARY

Renal injuries, both penetrating and nonpenetrating in type, are of infrequent occurrence. Most injuries are mild, causing only slight pain, hematuria and moderate abdominal rigidity. Many penetrative renal injuries require no treatment, and exploration of the renal region should be done only when there is extensive, persistent or recurrent hematuria and free perirenal bleeding, or extensive renal damage is suspected. Early recognition of the renal damage, conservative surgical treatment and suitable bed rest have definitely reduced the mortality and complications of both the penetrative and the nonpenetrative type of injury.

The location of the wound and the presence of hematuria are usually the first indications of renal damage in penetrating wounds. Roentgenographic examination gives valuable information relative to the state of the kidney and the possibility of associated lesions. Excretory urography is of value in indicating the location of the lesion and determining the presence and function of the opposite kidney. If cystoscopy is indicated, and time and the condition of the patient permit, it should be done.

The main points to be settled regarding the treatment of renal injury are whether exploration is necessary and, if so, when. When there are signs of internal hemorrhage, immediate operation may be necessary, but little is lost by a period of observant waiting. This allows time for the necessary diagnostic procedures to be carried out and time for the patient to recover from immediate shock, and, if exploration is finally necessary, surgical hemorrhage is usually less in amount than immediately after injury.

The three most common surgical procedures for both penetrating and nonpenetrating wounds are drainage, nephrectomy and plastic repair. Drainage of the renal area is the most satisfactory early procedure, especially in cases of penetrating wounds. It is simple and brief and permits evacuation of clots, removal of fragments of tissue and foreign bodies and the packing of the region to control hemorrhage. Nephrectomy is employed only when removal of the kidney is urgent, as when there is persistent excessive hematuria, extensive destruction of the vascular pedicle or complete shattering of the kidney. Plastic repair of the kidney, which is not infrequently carried out with success in closed civilian types of injury, is rarely indicated in the penetrative wounds. It is time consuming, at times it is followed by infection and hemorrhage and in some cases nephrectomy is necessary later.

1930 Wilshire Boulevard.

16. Fraser, J., and Drummond, Hamilton: A Clinical and Experimental Study of 300 Perforating Wounds of the Abdomen, Brit. M. J. **1**: 321-330 (March 10) 1917.

17. Walters, C. Ferrier; Rollinson, H. D.; Jordan, A. R., and Banks, A. Gray: A Series of 500 Emergency Operations for Abdominal Wounds, Lancet **1**: 206-213 (Feb. 10) 1917.

INJURIES OF THE URETER AND THEIR MANAGEMENT

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Wounds of the ureter alone are rarely encountered, either in civil or in military practice. In a survey of the collected cases of wounds of the urogenital tract from the records of the American Expeditionary Forces (World War I) Young [1] found only 4 cases of injury to the ureter alone. A survey of the records from our clinic revealed 25 cases of ureteral injury, in each of which it was unilateral. The etiologic classification of the series is given in table 1.

TABLE 1.—*Etiologic Classification*

I. Direct trauma:	
A. Gunshot wounds	1
B. Stab wounds	0
C. Operations:	
1. Accidental	9
2. Intentional	4
II. Indirect trauma:	
A. Manipulation of ureteral calculus	6
B. Disease processes:	
1. Of ureter	2
2. By extension	1
C. Injection of caustic	2
Total	25

TABLE 2.—*Summary Data of 25 Cases of Ureteral Injury*

Case	Sex	Side	Condition Found	Treatment	Result
1	♀	R	Indirect trauma	Nephrostomy	Death
2	♀	L	Indirect trauma	Nephrectomy	Recovery
3	♂	R	Direct trauma	Transperitoneal drainage; ureteral catheterization	Recovery
4	♀	L	Direct trauma, skin fistula	Ureterocolostomy	Recovery
5	♀	L	Direct trauma, skin fistula	Ureterocolostomy	Recovery
6	♀	L	Direct trauma, rectal fistula	Nephrectomy	Death
7	♀	R	Direct trauma, vaginal fistula	Nephrectomy	Recovery
8	♀	L	Direct trauma, vaginal fistula	Nephrectomy	Recovery
9	♀	L	Direct trauma	Repair of ureter	Recovery
10	♀	L	Indirect trauma	Nephrectomy	Recovery
11	♀	R	Indirect trauma, vaginal fistula	Nephrectomy	Recovery
12	♀	L	Direct trauma, vaginal fistula	Ureterocolostomy	Recovery
13	♂	L	Indirect trauma, skin fistula	Ureterocolostomy	Recovery
14	♀	L	Indirect trauma, vaginal fistula	Repair of ureter	Recovery
15	♂	R	Indirect trauma	Ureteral catheterization	Recovery
16	♂	R	Indirect trauma	Ureterostomy	Recovery
17	♂	R	Indirect trauma	Vesical anastomosis	Death
18	♀	L	Direct trauma	End to end anastomosis	Recovery
19	♂	L	Direct trauma	Ureterostomy	Recovery
20	♂	L	Direct trauma	Nephrectomy	Recovery
21	♀	R	Direct trauma	End to end anastomosis	Death
22	♀	L	Direct trauma, rectal fistula	Vesical anastomosis	Recovery
23	♂	L	Indirect trauma	Ureterocolostomy	Recovery
24	♂	R	Indirect trauma	Nephrectomy	Recovery
25	♀	R	Direct trauma	Vesical anastomosis	Recovery

The management of these injuries depends on the cause of the injury and on the time that has elapsed since it was sustained. If during a surgical operation the ureter is injured, immediate repair is indicated. The ends of a completely divided ureter may be united over a T tube or over a ureteral catheter passed upward to the renal pelvis and downward into the bladder. The anastomosis should be free of tension and the sutures, few in number, should not include the mucosa

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1. Young, H. H.: Wounds of Urogenital Tract in Modern Warfare, J. Urol. **47**: 59-108 (Feb.) 1942.

and should be lightly tied. A patch of fat over the suture line assists in making a water-tight joint. Drainage to the point of anastomosis should be provided, preferably extraperitoneal. These points are well illustrated by the following case, in which operation was performed by an excellent general surgeon,[2] who consulted me at the time and who has kindly permitted the use of the following data:

CASE 18.—A white woman aged 38, married, a quadripara, was undergoing a pelvic operation and the division of dense adhesions when the left ureter was unintentionally included in double clamps and divided. The accident was immediately recognized. A number 8 F. ureteral catheter was passed up the proximal ureteral segment to the kidney and down the distal segment to the bladder. End to end anastomosis was performed with use of number 00 chromic catgut interrupted sutures which avoided the mucosa. A tag of omentum was placed over the suture line. The catheter was removed after one week. The patient recovered without fistula.

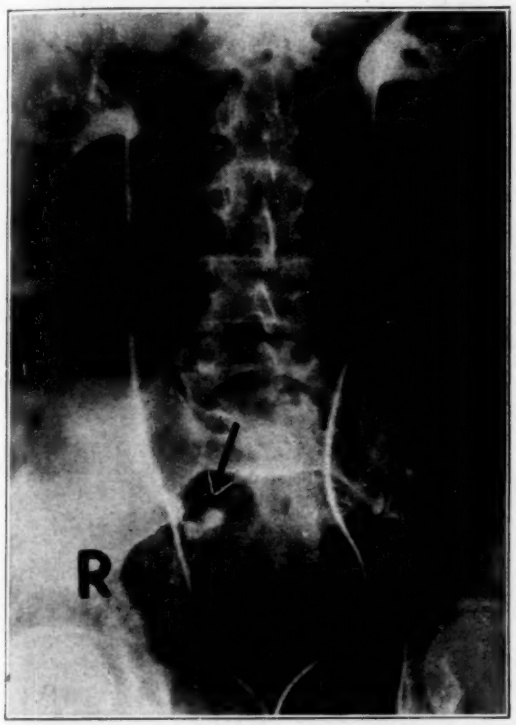

Fig. 1 (case 3).—Gunshot wound of right ureter: extravasation; opaque medium at injury.

The importance of drainage cannot be overemphasized; this may be extraperitoneal, by preference, or transperitoneal, by necessity. Failure to provide for the drainage of urine, which usually leaks from the repaired injury, often results in serious complications and sometimes in the death of the patient. This is illustrated by the following case:

CASE 21.—During an operation for the removal of a large intraligamentary cyst of the ovary by a general surgeon the ureter was not recognized until after it had been severed, as it had been displaced by the tumor. The severed ends were brought together over a ureteral catheter passed upward to the renal pelvis and downward into the bladder. The anastomosis was tightly performed, but drainage to the point of anastomosis was not instituted. Several days later the patient became acutely ill and showed evidences of general peritonitis, despite the fact that the catheter had been draining regularly. Death ensued shortly thereafter, and the postmortem examination revealed general peritonitis resulting from urinary extravasation.

2. Harkness, R. B.: Personal communication to the author, 1940.

PENETRATING WOUNDS

Gunshot and stab wounds require immediate operation, particularly when they involve the peritoneal cavity.

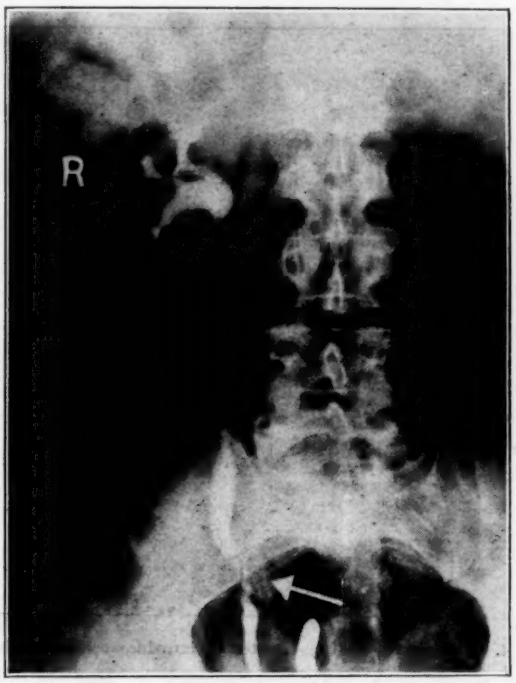

Fig. 2 (case 3).—End result in gunshot wound of right ureter.

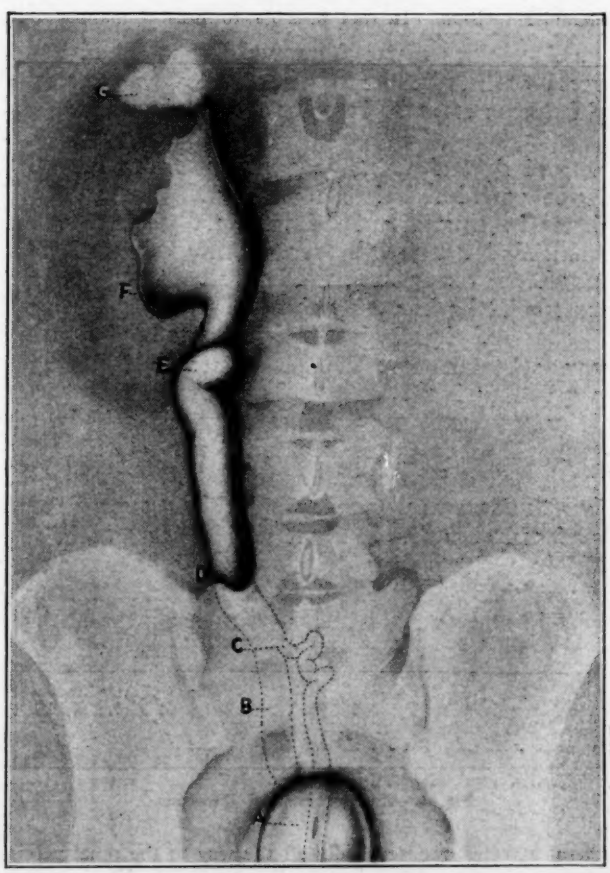

Fig. 3.—Condition revealed by vaginoureteropyelogram: *A*, vault of vagina; *B*, lower right ureter; *C*, fistulous tract; *D*, ureter above injury; *E*, additional ureteral obstruction; *F*, hydronephrosis; *G*, calcified gland.

CASE 3.—This case is unique in that a bullet which entered the right lower quadrant of the abdomen traversed the pelvic peritoneal cavity, severed (incompletely) the right ureter, perforated the left side of the sacrum (lead marks) and was palpable under the skin of the left buttock; it injured several

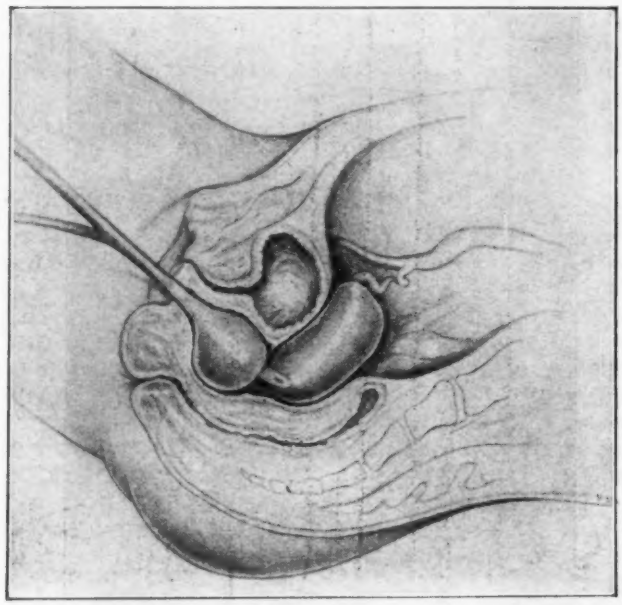

Fig. 4.—Employment of bag catheter to introduce opaque medium.

loops of bowel but did not perforate the mucous membrane of any loop. The extravasated urine was drained transperitoneally, as the exploration had been done through a low abdominal incision. It was possible to pass a number 8 F.

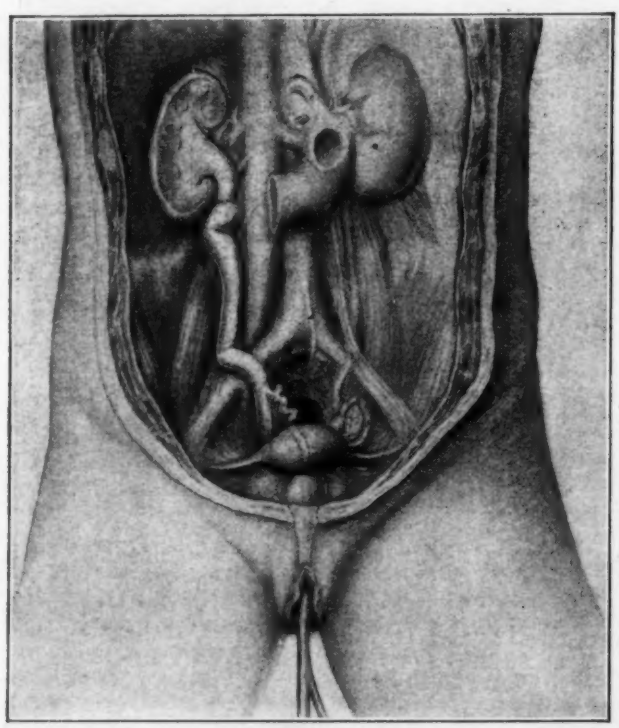

Fig. 5.—Anterior view of dissection.

ureteral catheter cystoscopically all the way to the renal pelvis, and the catheter was left in place for ten days. The recovery of the patient was uncomplicated except for an incisional hernia, which was repaired six months later (figs. 1 and 2).

SURGICAL WOUNDS

Accidental injury of the ureter not recognized at the time of operation usually results in complications, the more common of which are fistula, peritonitis and renal infection. In case of noninfected wounds, simple hydronephrosis followed by atrophy of the kidney may not give rise to acute illness and may not require surgical intervention. In the other group, urinary fistula develops in from one to three weeks, twelve days being the average in the series here reported. The fistula may communicate with the incision (skin) or with one of the nearby body outlets. Of the 9 cases, in 5 it complicated hysterectomy; in 2, removal of a large intraligamentous (retroperitoneal) ovarian cyst, and, in 2, excision of the rectum and rectosigmoid. The

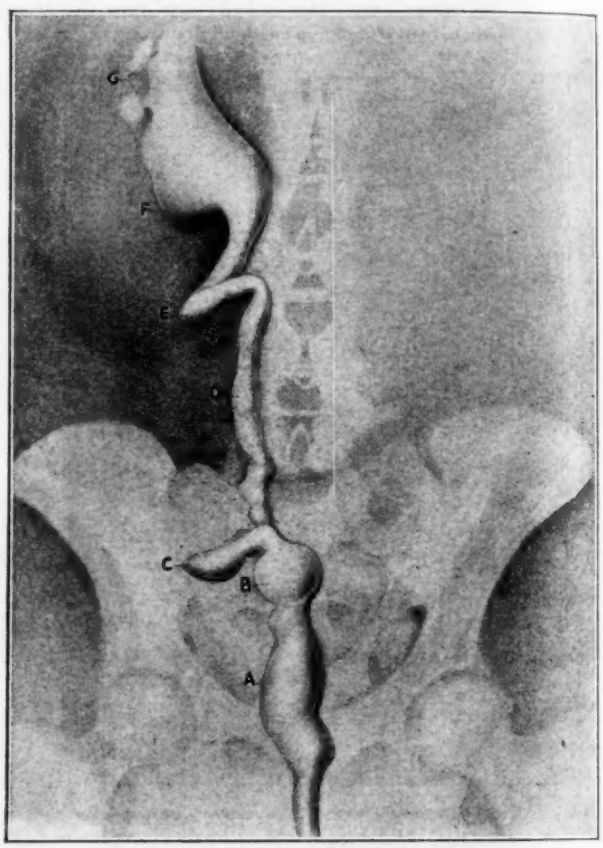

Fig. 6.—Condition revealed by rectal space ureteropyelogram: *A*, rectal space; *B-C*, fistulous tract; *D*, ureter above injury; *E*, tortuous ureter; *F-G*, hydronephrosis.

fistula communicated with the incision in 3 cases, with the vagina in 4 and with the rectal space in 2. Intravenous urography was helpful in demonstrating the side affected and in locating the site of the injury. Cystoscopy and ureteral catheterization in combination with x-ray and retrograde pyelography are the chief diagnostic procedures. Nephrostomy, pyelostomy or ureterostomy are necessary emergency measures in cases of obstruction or infection. The simplest and quickest drainage should be established for patients acutely ill. This temporary drainage may be sufficient in cases of ureteral ligation or incomplete trauma, as catheterization from below may be possible when the ureteral lumen becomes partially reestablished.

In exceptional cases the introduction of an opaque medium by way of the vagina (vaginoureteropyelography), the rectal space (rectoureteropyelography) or

the fistulous tract (fistuloureteropyelography) may aid materially in evaluating the case. These studies are made after the acute infection has subsided and are carried out in the following manner:

A 30 cc. bag catheter of the Foley type is introduced into the vagina, rectal space or other fistulous tract, as the case may be. The bag is inflated to block the outlet of the tract, and with the patient in the Trendelenburg position an opaque medium is injected through the catheter by means of a pressure syringe, and the roentgenogram is immediately made (fig. 3).

CASE 7.—A segment of the right ureter was accidentally excised during a hysterectomy. Primary anastomosis over a ureteral catheter was unsuccessful and resulted in a ureterovaginal fistula. The vaginoureteropyelogram demonstrates (*A*) the vagina, (*C*) a fistulous tract, (*E*) an additional ureteral obstruction, (*F*) hydronephrosis and (*G*) a calcified gland (proved by other studies). Right nephrectomy was performed, and the patient recovered.

CASE 6 (fig. 4).—An injury to the left ureter, inflicted during excision of the rectum and rectosigmoid but unrecognized during the operation, resulted in a ureterorectal space fistula. The rectal space ureteropyelogram demonstrates (*A*) the rectal

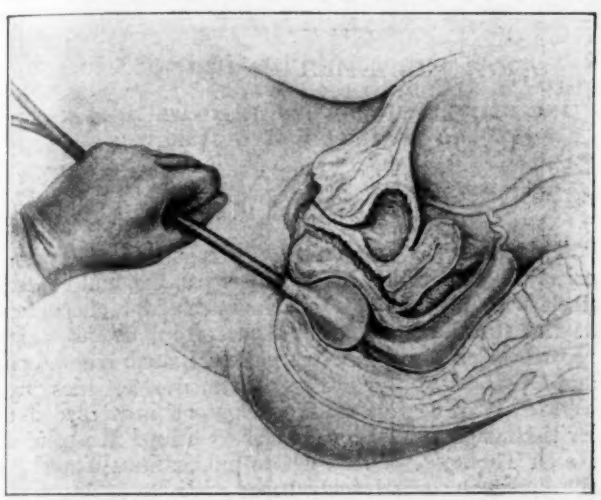

Fig. 7.—Use of bag catheter to introduce opaque medium.

space, (*B-C*) the fistulous area and (*F*) the hydronephrosis above a tortuous ureter. Left nephrectomy was followed by recovery.

Intentional surgical wounds of the ureter are made for removal of an impacted calculus, for relief of obstructions, for removal of a growth and for various plastic procedures. Owing to a variety of causes, the fistula thus established may persist. Even after nephrectomy a persistent discharge may sometimes annoy both the patient and the surgeon. Ureterograms and fistulagrams, together and separately, will aid in establishing the diagnosis. Patient 11 came under our observation after five operations for calculi in the right kidney and ureter.

CASE 11.—A nephrectomy had been performed for calculous pyonephrosis, after which the patient had a fistula which drained profusely. Figure 9 shows (1) the fistulagram, (2) the right ureteral catheter entering the fistula and (3) the ureter above the fistula before the nephrectomy. Figure 10 shows (1) the ureterogram after nephrectomy, (2) the opaque medium outside the ureter, (3) the drainage tube in the fistula, (4) the pocket in front of the ileum, (5) the ureteral fistula and (6) the ureter. The wound failed to heal, and at a final operation, undertaken with the idea of ureterectomy, a foreign body (sponge) was found in the pocket in front of the ileum. After the removal of this foreign body the wound healed.

MANIPULATION OF URETERAL CALCULUS

Rupture of the ureter, with urinary extravasation, cellulitis and abscess formation, was observed in 6 cases of this series, and in each the rupture had fol-

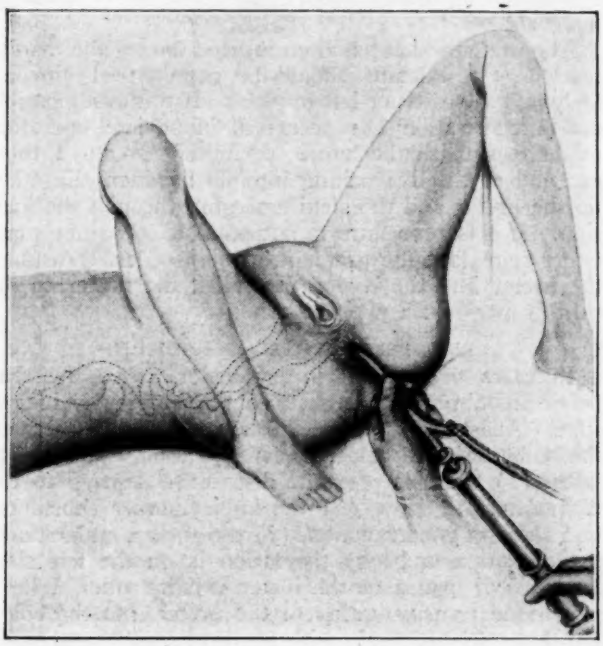

Fig. 8.—Further illustration of employment of bag catheter.

lowed the use of instruments within the ureter. One patient died of sepsis from retroperitoneal abscesses. All intraureteral manipulations and instrumentations should be carried out with gentleness, and the surgeon should be prepared for immediate open operation if

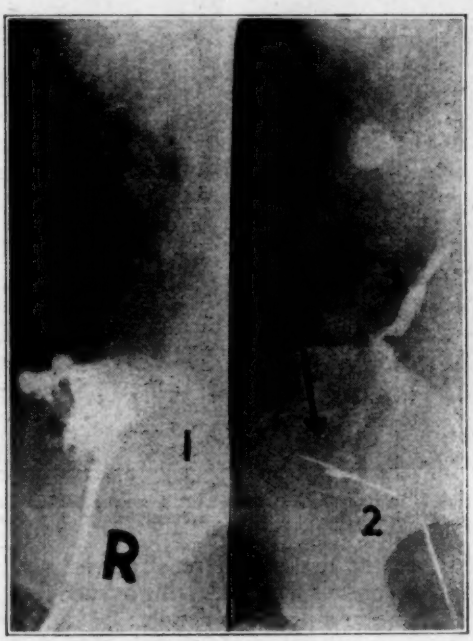

Fig. 9.—1, fistulagram; 2, ureteral catheter entering fistula; 3, ureterogram.

instruments other than ureteral catheters are to be employed. It is much safer to pass one or more ureteral catheters above an obstructing calculus and allow them to remain in place than to pass a wire basket or other instrument that might injure the ure-

teral mucosa or the entire thickness of the tube. If a basket is used and, after engaging the stone, the operator finds it difficult to extract the instrument, it should be left in place for twenty-four to forty-eight hours, during which time gentle traction is made at intervals.

The ureter which has been injured during the manipulation of a calculus should be catheterized immediately and the catheter left in place. If this is impossible and extravasation has occurred, immediate operation might reestablish the lumen, preferably over a T tube, one end of the T reaching into the bladder, the other up the ureter and the stem emerging through the incision. If this procedure is not possible, then one must either reimplant the ureter into the bladder, transplant the ureter into the bowel, transplant the ureter to the skin or perform a nephrectomy.

URETEROINTESTINAL ANASTOMOSIS

In cases of ureteral injury at or above the true pelvic inlet, reimplantation into the bladder is impossible. Anastomosis of the upper ureteral segment with the colon should receive consideration, particularly when (*a*) there is previous disease or damage to the contralateral kidney, (*b*) the kidney under consideration shows a good function, (*c*) the patient understands the operation and (*d*) the lesion is on the left side. In cases of injury to the lower urinary tract, I have performed transplantation of the ureter into the colon ten times (8 patients), with no deaths.

INJECTION OF CAUSTIC AGENTS

The accidental injection of a caustic fluid was formerly more likely when sodium hydroxide was included in the cystoscopic setup. This solution was easily mistaken for the opaque medium, and, when it was

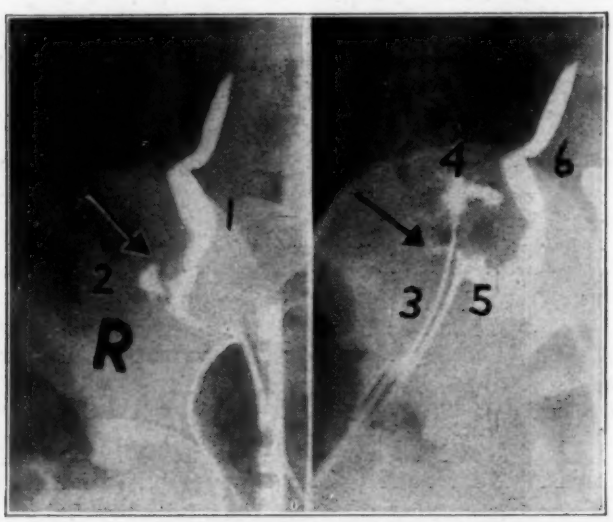

Fig. 10.—1, ureterogram; 2, extraureteral opaque medium; 3, tube in fistula; 4, pocket anterior to ilium; 5, ureteral fistula; 6, ureter.

injected into the ureter and renal pelvis, severe damage to both organs resulted. Two such cases came under my care in a previous decade:

Case 1.—An elderly white woman was undergoing cystoscopic study. Labels on two bottles had been reversed, and sodium hydroxide was injected through the right ureteral catheter. The patient suffered excruciating pain and went into shock. Several days later a right nephrostomy was performed; the patient's condition was critical and became steadily worse. She died five days after the accident. The postmortem examination revealed suppurative pyelonephritis with cortical abscess and septicemia.

Case 2.—During cystoscopic examination of a 40 year old white woman, sodium hydroxide was accidentally substituted for the opaque medium and injected through the left ureteral catheter. The patient immediately complained of exquisite pain and went into shock. The solution was withdrawn and the pelvis lavaged with water followed by diluted hydrochloric acid. The patient was returned to her room. The left ureter was drained by catheter. After several weeks of illness she made a partial recovery, at which time she came under our observation. The diagnosis was pyelonephritis, suppurative, chronic, left. Left nephrectomy was performed, and the patient recovered.

SUMMARY

1. Penetrating wounds of the ureter alone are seldom encountered in either civil or military practice.

2. Injury of the ureter should be treated surgically, promptly and with provision for adequate drainage.

3. Ureterostomy, pyelostomy and nephrostomy are employed to combat infection and obstruction.

4. Ureterointestinal anastomosis offers an opportunity to save the kidney in selected cases.

5. Nephrectomy is often necessary.

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BLADDER INJURIES

INCLUDING SPINAL CORD INJURIES AS RELATED TO WAR AND CIVIL PRACTICE

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This paper is suggested by reason of the present crisis through which the world is passing and concerns itself with injuries to the urinary bladder encountered as the result of warfare. Apart from consulting the records of personal experiences in a British base hospital and established medical department statistics from World War I, full acknowledgment is accorded the British surgeons Gordon-Taylor,[1] Clifford Morson[2] and Ralph Thompson,[3] from whose publications material on the present war is largely based.

In the present world conflict, as in World War I, a definite ratio of bladder to general systemic injuries is occurring. The theme, however, in the present war differs in that the ratio is greater and, because of the predominance of high explosive bombing, the nonpenetrating or concussion injuries considerably exceed the penetrating. During World War I it is estimated that about 70 per cent of bladder injuries were of a penetrating nature, whereas the blast injuries were at a minimum.

The concussion "blast" produced by modern aerial or artillery bombardments may rupture the abdominal viscera without external wound and produce extensive blood or urinary extravasation. Such injuries may result from hurling against the parietes fragments of wood, iron or masonry from demolished buildings.

The distended bladder has a decidedly increased liability to rupture in circumstances of trauma to the lower abdomen, and unless there is an associated fracture of the pelvis the empty bladder is very rarely ruptured.

This paper, in a symposium on "War Injuries," is published under the auspices of the Section on Urology.

1. Gordon-Taylor, Gordon: War Injuries of the Kidney, Ureter and Urinary Bladder, Post-Grad. M. J. **16**: 125 (April) 1940.

2. Morson, Clifford: The Care of the Bladder in Injuries of the Nervous System, Practitioner **14**: 305 (May) 1932.

3. Thompson, A. Ralph: Injuries of the Bladder, Brit. J. Urol. **12**: 177 (Sept.) 1940.

Fractures of the pubis and the combined fracture of iliac and pubic portions of the pelvic girdle are the types of fractures which are especially prone to be complications with a ruptured bladder. In this respect the greater number of bladder injuries occurring in the present war do not vary manifestly in character from those occurring in our civil life as the result of automobile accidents, industrial injuries, and the like.

In a series of bladder injuries at an English base during World War I, 40 per cent of the bladder injuries were complicated by damage to the pelvic girdle; the pubic portion of the pelvic girdle was most frequently damaged, but no segment of its bony circumference was immune.

The severity of the osseous injury varies from simple perforation or mere notching to that of fragmentation with spicules of bone being driven into the cavity of the bladder. Bony rarefaction may occur with subsequent development of osteomyelitis and sequestration. Bony damage augments the risk and severity of bladder sepsis, with resultant formation of sinus tracts with prolonged discharge of urine and pus from the wound made by the missile or from the openings on the skin of the groin, perineum or thigh as the result of the diffusion of the infection.

Cuthbert Wallace, a British surgeon of World War I, in a series of 965 laparotomies performed at a British casualty clearing station found bladder injuries 45 times, or in 4 per cent of the cases. From a British base hospital during the last great war a detailed study of 53 cases of bladder injury revealed that 70 per cent of the wounds of gunshot origin had the point of entry in the buttock, 70 per cent had the missile retained and in 70 per cent there was concomitant injury of intestine, of bone or of both. The rectum was damaged in 19 cases, in 3 of which the wound was intraperitoneal and in 16 extraperitoneal. A suprapubic wound of entry was rarely encountered in gunshot wounds of the bladder. Rather, as just noted, the entry was mainly through the buttock with the missile traversing in an oblique and upward direction. Other wounds of entry less frequently encountered than the buttock were found in Scarpa's triangle, lower down the thigh and in the iliac fossa, groin, sacral and perineal regions. Bullet wounds of the bladder are occasionally through and through, and, should the empty bladder be perforated from side to side the lesion may assume a benign character.

Because of the awareness that bladder injuries are usually complicated, the time held concept of intraperitoneal and extraperitoneal damage as a simple lesion per se is revised.

The Manual of Military Urology incorporates the following statements:

> Experience of this war has gone far to eliminate the classic distinction of injuries to the bladder whereby they are divided into two groups, the intra- and extraperitoneal. In the description of symptoms and treatment, however, the distinction of extra- and intraperitoneal injuries must be maintained for the sake of clarity. But in the field the surgeon will find that most of the intraperitoneal bladder wounds are associated with extraperitoneal wounds and that the diagnosis of extraperitoneal injuries founded upon the absence of abdominal tenderness and rigidity may ultimately be belied by a fatal peritonitis. The following classification, therefore, simply represents the various combinations which may occur and artificially dissociates the complex pathologic conditions resulting from wounds of the pelvis or abdomen that involve the urinary bladder.

1. Intraperitoneal injuries.
   - (*a*) Wounds.
     1. Uncomplicated.
     2. Complicated by
        - (*a*) Perforations of other viscera.
          1. The small intestine.
          2. The colon.
        - (*b*) Fractures or injuries of bones.
        - (*c*) Injury to large blood vessels.
   - (*b*) Ruptures by concussion.
     1. Complicated.
     2. Uncomplicated.
2. Extraperitoneal injuries.
   - (*a*) Wounds.
     1. Uncomplicated.
     2. Complicated by
        - (*a*) Injury to rectum.
        - (*b*) Injury to deep urethra or prostate.
        - (*c*) Fractures of the bony pelvis or femur.
        - (*d*) Injury to important blood vessels.

The symptoms of intraperitoneal wounds of the bladder vary according to the course and size of the lesion, the most noticeable being the urgent desire to urinate and usually the inability to do so. Frequently only a small amount of bloody urine can be expelled. Blood in the bladder is always present but frequently cannot be ascertained except by catheterization. Catheterization may reveal fecal material and gas formation in the bladder, denoting communicating injury of the rectum. With a catheter in situ, an anterior and lateral x-ray examination with air injection or the instillation of a dilute nonirritating opaque medium such as diodrast will establish a diagnosis.

The prognosis of bladder injuries accompanied by intestinal wounds during the first world war was dismal in the extreme. Mortality averaged better than 90 per cent.

It is suggested by Gordon-Taylor that the greatly increased mortality in cases in which operation is performed for intestinal and bladder injury over that attending the surgical treatment of intestinal injury alone may be related to the greater expenditure of time in securing good bladder suture at the end of a time consuming intestinal operation.

To the credit of ever improving surgical technics, the prognosis in bladder injuries with plurivisceral damage is no longer "dismal in the extreme." In the early hours after wounding, the surgeon's activities are now directed toward the immediate saving of life by recovery from shock, systemic antisepsis and adequate drainage, succeeding all of which the surgeon can institute deliberate reparative surgery.

Perforation of the small intestine is most common, but the large intestine and rectum are injured with great frequency. In urgent traumatic surgery of the abdomen no operation is complete until the bladder has been thoroughly inspected. Frequently an unsuspected gunshot wound of the bladder is discovered during the laparotomy. The bladder should be sutured whenever the condition of the patient and the accessibility of the vesical wound render this possible. Intraperitoneal wounds present no difficulty unless the rent is situated at the bottom of the pouch of Douglas. When suture is deemed too difficult, an adequate suprapubic drainage tube must be instituted with completely ample perivesical drainage to the site of the wound.

An indwelling catheter through the urethra has many drawbacks in the transport and handling of wounded

men and in warfare greatly augments the risk of severe urinary sepsis. When the bladder and pelvic rectum are both wounded, suture of each viscus must be performed. In injuries of the perineal rectum and the extraperitoneal part of the bladder, suture may be very difficult. In such instances adequate perineal, perivesical and suprapubic vesical drainage must be instituted. When stabilization and a more favorable surgical environment occur, a perineal rectovesical repair can be done.

The concussion rupture of the bladder most usually fragments the structure. In such instances all mucosa should be jealously preserved, and great caution should be used in removing any tissues near the rupture. The rapidity with which islands of mucous tissue regenerate and coalesce to form new bladder lining is frequently astounding.

Extraperitoneal wounds of an uncomplicated character produce blood in the urine, difficult urination and extravasation. There may be few symptoms at first, but under observation, if extravasation is occurring, suprapubic discomfort and a palpable mass appear. Wounds occurring in the buttocks, thighs, hips, perineum or genitalia with remote evidence of abdominal symptoms is suggestive of extraperitoneal rupture and should be carefully investigated. In extraperitoneal ruptures the urinary extravasation will follow the fascial planes.

Extravasation from a bladder rent occurring in the front may travel upward between the peritoneum and the abdominal muscles or, if the rent is more posterior, the extravasating urine may dissect extraperitoneally along one or both ureters, forming a bulging palpable mass in one or both flanks. Retrovesical extravasation may pass through the sciatic notch to the buttock, may pass through the obturator foramen to the thigh or follow through the inguinal canal to the scrotum. With infection supervening, fever, leukocytosis and evidence of sepsis quickly follow.

Necessary primary surgical intervention is best carried out at the advanced surgical hospitals at the front. With no evidence of intraperitoneal injury and adequate urinary drainage established, a "hands off" policy may be assumed until the patient reaches a more favorable surgical environment; otherwise, should there be apparent danger of extravasation, expeditious surgical intervention should be instituted by suprapubic tube and adequate regional drainage. The dictum should be supportive treatment and no more immediate surgical intervention than necessary.

THE TRAUMATIC CORD BLADDER

A second and equally distressing problem as it pertains to the bladder in warfare are spinal cord injuries and the bladder sequelae arising from them. Much desultory writing has been presented in urologic literature, with but little attempt at correlation.

Injuries to the spinal cord produce bladder paralysis by severing the continuity of the reflex arc controlling the act of voiding, and consequent urinary retention results. The bladder rapidly distends to such formidable size as to establish fear of rupture. If the injury is above the 11th dorsal segment, an overflow dribbling quite readily occurs; conversely, an injury below this level is likely to establish a spasm of the vesical sphincter. If the problem was merely that of the relief of urinary retention there would be no necessity for discussion. But, as the statistical records of the American and British hospital services in World War I amply testify, the problem is one of urinary tract infections.

The Manual of Military Urology of the American Expeditionary Forces urged a course of nonintervention in these bladders, assuming that the bladder would automatically care for itself (automatic bladder).

Young[4] states "We have been unable to obtain accurate statistics as to how successful this was. In many instances we find that surgeons ultimately thought it necessary to provide suprapubic drainage or catheterization, intermittent or inlying, in order to relieve great vesical distention. It is impossible for us to find out what success this plan had in ultimately preventing the infection and ascending destruction of the kidneys in these cases."

Early British experience with the same procedure established that eventually 100 per cent of such cases became infected, and especially did those cases become rapidly infected when catheterization was done.

Sir Thompson Walker in his Hunterian lecture reported 450 cases of spinal injuries from which there were 179 deaths due to sepsis following overdistention and catheterization.

In my experience rarely did a patient with a spinal injury arrive at the base without having been catheterized from one to several times, and all with severe sepsis. The patients reaching the base hospital who fared best clinically were those who had had early suprapubic drainage, and even in those already severely infected suprapubic drainage with the attendant increased facility for antisepsis sharply reversed the mortality experience.

With the knowledge of this experience in World War I, a subsequent survey was made of a number of orthopedic and industrial surgeons in the country. Interestingly, every surgeon interviewed voiced the paramount importance of avoiding urinary tract infection, and for this reason, sixty-three surgeons resorted to the establishment of automatic overflow in all cases. Likewise for the same reason, fifty surgeons instituted an immediate continued regimen of intermittent catheterization, thirty-three an indwelling catheter and twenty-nine surgeons instituted an immediate or later permanent suprapubic drainage. Practically no answers could be obtained relatively to mortality from urinary tract infection complications. Only five surgeons stated that it was their practice to handle the complicating condition with a urologist as a consultant. With the knowledge that over 50 per cent of orthopedic and industrial surgeons interviewed in civil life are votaries of some type of catheter drainage and knowing as we do the catheter to be the grand executioner in a great number of these cases, a plea is made for the revival of Sir Thompson Walker's dictum of immediate suprapubic drainage.

Probably the most nearly ideal approach to these cases is detailed by Dr. Clyde Deming[5] of Yale University Hospital. He states that:

> Our procedure for having paralytic bladders due to a fractured spine is to open the bladder with a Kidd cystotome by the suprapubic route and drain as soon as possible.
>
> We see all the paralytic bladder cases which come into our hospital. They are admitted to the orthopedic service, and the fractured vertebra is treated by an orthopedic surgeon. If, however, there is paralysis of the limbs, the patient is examined by the Neurological Service and if there is any indication for neurological surgery this is done by the neurological surgeons, such as decompression of the cord.

4. Young, Hugh H., and Davis, D. M.: Young's Practice of Urology, Philadelphia, W. B. Saunders Company, 1926, vol. 2, p. 695.
5. Deming, C. L.: Personal communication to the author, March 30, 1932.

We do not allow these individuals to develop an automatic bladder, as it has been our experience that all of these cases develop infection and that it is much better to drain the bladder before infection takes place, as the drainage can be done in a very aseptic manner without leakage and without much infection later on.

When these cases come to us with infection in the bladder we open and drain them immediately.

We have found that all paralytic bladders heal very nicely if we want them to. Of course, the position of the fracture makes some difference as to the handling of these cases, but we have felt that when a case is to have a long period of paralysis or continued paralysis it is much better to drain the bladder early than wait for infection. In this way, we can handle the cases without kidney infection and keep them in much better general condition.

SUMMARY

1. Wounds of the bladder are usually complicated and extremely dangerous.
2. Restorative procedures and the emergency surgery necessary should be done at front line hospitals, special attention to drainage and to the frequency of intraperitoneal and intestinal injuries being given.
3. Necessary reparative procedures for complicating conditions and restoring the urinary tract to normal should be done at the base hospital.
4. Urologic consultation should be sought in all cases of cord bladder from spinal injury.
5. The cord bladder as the result of spinal injury should never be catheterized.
6. Previously catheterized and all infected bladders should have immediate suprapubic drainage.
7. In civil practice the experiences of bladder injuries of war can be adopted with great profit.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SCHOLL, MC IVER, BYWATERS AND MUNGER

DR. W. F. BRAASCH, Rochester, Minn.: The incidence of renal injury in war probably is greater than the records would show. There are many cases with injury to various intra-abdominal organs, including the kidney, which never have been reported. Coincident injury of the kidney occurs most frequently with penetrating lesions of the intestine, liver, lower part of the thorax and the spleen. When it occurs in these cases the usual diagnostic signs and symptoms of renal injury may be of little value. Most of the patients are in shock, and the symptoms caused by lesions in other organs are predominant. The immediate mortality is great. The incidence of penetrating abdominal injury in which only the kidney is involved is comparatively rare. Routine inspection of the urine for evidence of hematuria is imperative in every case of intra-abdominal injury. If the patient cannot void, he should be catheterized. The usual methods of urologic diagnosis, which are available only at general hospitals, are not of much immediate help in many of these cases. Since most of the patients are in shock, the excretory urogram is of little or no value in visualizing the degree of injury. Cystoscopy rarely is indicated. The treatment of nonpenetrating renal injury such as may result from contusion and falls is quite different. With this type of injury the usual methods of investigation and treatment employed in civilian life may be used. Such injuries are not of common occurrence in the armed forces. Profound shock, which usually is observed with multiple intra-abdominal wounds, often is absent in spite of hematuria. Conservative treatment in these cases, as in civilian life, usually is advisable. There may be, however, specific reasons for surgical intervention, such as rapidly extending hematoma, severe pain or physical evidence of extensive renal injury. With every injury involving the lumbar and lateral abdominal areas the urine, voided or catheterized, should be examined. The extent of the renal injury frequently can be determined by a preliminary excretory urogram. In many cases, however, the urogram will fail to give definite evidence of the extent of the lesion because of obscuring intestinal gas or inadequate visualization. The absence of any visualization of the renal pelvis in the excretory urogram does not mean necessarily that surgical intervention is indicated. Renal injury may be great enough to prevent temporarily excretion of the dye in the affected kidney but, after the reflex influence of injury has passed and the lesion is healed, the renal function may return to normal. If the excretory urogram is a failure and if the patient's condition becomes worse, cystoscopy with retrograde urography is advisable. I am inclined to agree with Sargent that no harm will result to the patient by employing cystoscopy with retrograde urography, and it frequently is the only way in which an exact diagnosis can be made. Necrotic muscle tissues apparently create a substance, probably myohemoglobin, which is highly toxic and damages the excretory renal tissues, causing symptoms of shock and uremia. Dr. Bywaters' statement that shock is not a clinical entity but a syndrome caused by a great variety of conditions would seem to be justified. His observation that serum potassium is increased and that electrocardiographic changes of potassium poisoning occur corroborates those made by Keith, King and Osterberg. Although the clinical data are not parallel, nevertheless the shock and uremia which follow instrumental perforation of the suprapubic or perineal tissues come to the mind of the urologist who has been unfortunate enough to observe such complications. Equally puzzling is the renal deficiency, with uremia, which not infrequently follows loss of a large amount of blood such as may occur with transurethral prostatic resection. In these circumstances usually there is no clinical evidence of shock, nor are there any subjective symptoms of uremia until late. However, the gradually mounting blood urea and the gradually diminishing urinary output indicate the renal lesion. The renal failure is progressive in many of these cases in spite of every effort made to restore renal balance and may terminate fatally; there is no hemoconcentration, nor does there seem to be any potassium imbalance until the later stages of uremia. Nevertheless, postmortem examination of the kidneys reveals a pathologic condition similar to that described by Dr. Bywaters: an acute nephrosis, as though some toxic substance had been liberated into the blood stream and, when excreted in the kidneys, caused profound renal damage.

DR. O. S. LOWSLEY, New York: These papers are particularly well prepared discourses on war injury and effect on the kidneys. Dr. Scholl has given an excellent picture of the pathology, symptoms and diagnosis of injury to the kidney, as well as treatment. He has mentioned the attitude which we take toward patients with a history of trauma to the kidney followed by hematuria. I wish to emphasize that watchful waiting is a much more dangerous procedure than operating under our present excellent aseptic technic, not necessarily because of immediate results but particularly as regards remote damage to the kidney. It has been proved that kidney damage, not necessitating an emergency operation, may result in permanent damage to the kidney, elevation of the blood pressure and great destruction of kidney tissue. With the benefit of ribbon-gut repair of traumatized kidneys proved on animals and human beings, there is no jeopardy to the patient's life by removing the clots and repairing the damage done to the kidney. Draining the kidney pelvis for a period of time will prevent extravasation of urine and subsequent damage to the glomeruli and tubules and thus prevent further damage. Every patient with gunshot wound of the kidney should be operated on as soon as the diagnosis is made. Dr. Bywaters has brought out an important point in connection with the kidneys of persons who have received crushing injuries to other parts of the body. Patients who recovered after such a severe type of injury showed a low urinary output. The first day there would be a rise in the blood urea nitrogen to 60 or even 100 mg. per hundred cubic centimeters; on the second day it will be normal. They are left with unimpaired renal function. Those who are more seriously damaged may have a blood urea nitrogen as high as 400 or 500 mg. per hundred cubic centimeters. On the critical period, on the seventh day, a diuresis occurs and is maintained for several days until the retained nitrogen is entirely secreted. Then the blood pressure falls to normal and the renal function

returns slowly to normal and it may take five months for the urea clearance figures to be normal. Damage to the compressed muscle in such severe cases is never completely repaired. In fatal cases, two thirds of the deaths occurred at the end of the first week, the majority on the sixth day. The potassium level in the serum increases sometimes to more than twice the normal upper level. The pathologic changes in the kidneys show swollen tense structures with foci of tubular necrosis most pronounced in the boundary zone. This damage seems to be due to the precipitation in acid urine with high salt concentration and hematin and subsequent blockage of the tubules. The treatment of such cases, according to Bywaters, consists first of administration of fluid in alkali and the usual treatment of shock in the form of morphine for pain and blood transfusions. Renal failure is treated by the use of diuretics as sodium bicarbonate and concentrated serum. Decapsulation has been advocated and insulin and dextrose may be valuable.

PENICILLIN TREATMENT OF SULFONAMIDE RESISTANT GONOCOCCIC INFECTIONS

IN FEMALE PATIENTS

PRELIMINARY REPORT

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AND
ISAAK GRUNSTEIN, M.D.
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Several publications,[1] have already appeared on the subject of penicillin treatment of sulfonamide resistant gonococcic infections. These reports, however, dealt exclusively with infections in the male. The present report deals with the result of penicillin treatment of sulfonamide resistant gonococcic infections in 44 women.

All of the women included in this study were hospitalized for the purpose of penicillin treatment in the gynecologic service of Bellevue Hospital. After an initial follow-up of at least five clinical and bacteriologic examinations the patients were discharged with instructions to report at the clinic of the Gonococcus Research Unit, Department of Health, City of New York, for further observation.

CLINICAL MATERIAL

Forty-two of the 44 cases had failed to respond to at least 2 courses of 20 Gm. of sulfathiazole. The remaining 2 women had exhibited a definite hypersensitivity to sulfonamide and therefore were given penicillin treatment.

The presence of gonococcic infection was verified by smears and cultures performed at the laboratory of this unit. Infection of the cervix alone was reported in 12 patients, of the urethra alone in 1 and a concurrent infection of the urethra and cervix in the remaining 31. Involvement of the adnexa was found in 15 patients. Four of the women were pregnant. The average duration of infection prior to penicillin treatment was 92.5 days (maximum nine months, minimum twenty-one days).

TREATMENT

Each 10,000 Oxford units of penicillin was dissolved in 2 cc. of sterile isotonic solution or distilled water. The penicillin was injected intramuscularly in the gluteal region. Injections were repeated at three hour intervals.

DOSAGE

The accompanying table represents the number of patients treated and the amounts of each single dose and the total dosage of penicillin administered at three hour intervals.

RESULTS OF THERAPY

All 44 patients were apparently cured by penicillin treatment. In 1 case, however, a relapse occurred on the second day following the termination of therapy. This patient had received only 50,000 Oxford units of penicillin; she became bacteriologically negative after subsequent treatment with an additional 100,000 Oxford units of penicillin.

Following penicillin treatment, daily clinical and bacteriologic examinations were performed. All the patients showed a reversal of their initial bacteriologic findings from positive to negative within twenty hours after the termination of penicillin therapy. Follow-up at Bellevue Hospital was continued for an average of 7.2 days, and an average of 5.8 bacteriologic examinations were performed on each patient. The additional average follow-up period in the clinic of the Research Unit was 38.4 days, and an average of 3.6 examinations were performed up to date. All the patients followed up (37) remained bacteriologically negative throughout this period.

No significant changes in the amount and character of the cervical discharge after penicillin treatment were observed. However, the urethral discharge in a number of cases decreased or disappeared completely. Among the 15 patients with adnexal involvement the inflammation subsided in 7 and remained the same in 5 others. In the remaining 3 an exacerbation of the adnexal involvement was observed following the use of penicillin. One of the 24 patients without any adnexal disease prior to penicillin treatment developed salpingitis following therapy.

The course of the pregnancy in 4 patients was affected in no way by the penicillin treatment.

Eleven of the 44 patients studied suffered from a concurrent infection with Trichomonas vaginalis, which remained entirely unaffected by this type of treatment.

In addition to the penicillin treatment of women there was 1 case of sulfonamide resistant gonococcic vaginitis in a child aged 5 years, who was given four single doses of 10,000 Oxford units of penicillin at three hour intervals (Children's Medical Service of Bellevue Hospital, Dr. James L. Wilson, director). This child promptly became negative and remained negative during a follow-up period of twenty-five days.

TOXICITY

The administration of penicillin in the recorded dosage produced no toxic effects. The only complaint mentioned by nearly all the patients was that following

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The laboratory work was aided by a grant from the United States Public Health Service.

From the Gonococcus Research, Department of Health, City of New York, and the Obstetrical and Gynecological Service (Third Surgical Division), Bellevue Hospital, and from the Department of Obstetrics and Gynecology, New York University College of Medicine.

The penicillin was provided by the Office of Scientific Research and Development from supplies assigned by the Committee on Medical Research for clinical investigations recommended by the Committee on Chemotherapeutic and Other Agents of the National Research Council.

1. Herrell, W. E.; Cook, E. N., and Thompson, L.: Use of Penicillin in Sulfonamide Resistant Gonorrheal Infections, J. A. M. A. **122**: 289 (May 29) 1943. Mahoney, J. F.; Ferguson, Charles; Buchholtz, M., and Van Slyke, C. J.: The Use of Penicillin Sodium in the Treatment of Sulfonamide Resistant Gonorrhea in Men, Am. J. Syph., Gonor. & Ven. Dis. **27**: 525, 1943. Van Slyke, C. J.; Arnold, R. C., and Buchholtz, M.: Penicillin Therapy in Sulfonamide Resistant Gonorrhea in Men, Am. J. Pub. Health **33**: 1392, 1943.

the penicillin injection numbness or pain radiating from the site of injection in the gluteal region down to the thigh or to the ankle occurred. These symptoms lasted for only a few minutes.

COMMENT

Reviewing the results obtained thus far, it appears that a minimum total dosage of 75,000 Oxford units of penicillin is satisfactory in the treatment of sulfonamide resistant gonococcic infection in the adult female. If this observation is confirmed further, it will be possible to control sulfonamide resistant gonorrhea by one day treatment of ambulatory patients. The single relapse among a group of 9 women, each of whom had received a total dosage of 50,000 Oxford units of penicillin, points to a varying individual susceptibility to this agent. Smaller dosage of penicillin may prove adequate in many cases. This difference in the degree of susceptibility to the therapeutic action of penicillin has also manifested itself in in vitro experiments carried out by this unit.[2]

Dosage of Penicillin Administered in Various Groups of Sulfonamide Resistant Gonococcic Infections in 44 Adult Female Patients

Group	Number of Patients	Single Dose	Number of Injections	Total Dosage
1.....	12	20,000 Oxford units	5 doses	100,000 O. U.
2.....	10	25,000 Oxford units	4 doses	100,000 O. U.
3.....	12	25,000 Oxford units	3 doses	75,000 O. U.
4.....	1	20,000 Oxford units	3 doses	60,000 O. U.
5.....	8	25,000 Oxford units	2 doses	50,000 O. U.
	1*	25,000 Oxford units	2 doses	50,000 O. U.
		25,000 Oxford units	4 doses	100,000 O. U.

* Only failure after total dosage of 50,000 Oxford units; responded to an additional total amount of 100,000 Oxford units.

SUMMARY AND CONCLUSIONS

1. Forty-two adult female gonorrheal patients who did not respond to at least two courses of sulfathiazole were treated with various amounts of penicillin. Two additional infected patients were also given penicillin because they were sensitive to sulfonamides.

2. Forty-three women of the total of 44 promptly became bacteriologically negative after treatment with penicillin and remained negative during the follow-up period.

3. Only 1 of a group of 9 patients showed a relapse following a total dosage of 50,000 Oxford units of penicillin; she responded to an additional total amount of 100,000 Oxford units of penicillin.

4. The bacteriologic reversal from gonococcus positive to negative took place as a rule within twelve hours following the termination of therapy.

5. A total dosage of 75,000 Oxford units of penicillin appears to be satisfactory in the treatment of sulfonamide resistant gonorrhea in the adult female. This therapy may be completed within a period of six hours.

6. A child aged 5 years with a sulfonamide resistant gonococcic vaginitis became bacteriologically negative after a total dosage of 40,000 Oxford units of penicillin.

7. No toxic effects due to the administration of penicillin were observed.

Room 1020, 125 Worth Street.

2. Cohn, A., and Seijo, I.: The in Vitro Effect of Penicillin on Sulfonamide Resistant and Sulfonamide Susceptible Strains of Gonococci, to be published.

THE IN VITRO EFFECT OF PENICILLIN

ON SULFONAMIDE RESISTANT AND SULFONAMIDE SUSCEPTIBLE STRAINS OF GONOCOCCI

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The exceptionally powerful inhibitory effect of penicillin on the growth of the gonococcus in vitro has already been reported.[1] The current study was undertaken to evaluate these findings and to determine specifically whether or not there was any difference in the antibacterial action of penicillin against sulfonamide resistant and sulfonamide susceptible gonococcus strains. An attempt was also made to study the effect of combined "subtherapeutic" doses of sulfathiazole and penicillin on sulfonamide resistant strains. The object of this experiment was to see whether the combined antibacterial action of these two agents would be effective when the action of each individual agent was not sufficient to kill off the organisms.

TECHNIC

The technic followed in these test tube experiments was identical with that previously described for the in vitro differentiation of sulfonamide susceptible and resistant strains, with the only difference that penicillin [2] was substituted for sulfathiazole.[3] The penicillin powder was diluted in sterile distilled water, and from this stock solution serial dilutions were prepared and added to the blood in such a manner that a dilution of 1 cc. of stock solution in 10,000 cc. of blood contained 0.176 Oxford Units per cubic centimeter. The various dilutions of penicillin used were 1:10,000, 1:100,000, 1:200,000, 1:500,000 and 1:1,000,000. In each experiment at least two and usually three or four different dilutions of penicillin were tested simultaneously. Control bloods without penicillin were included in every experiment and always showed satisfactory growth of the organisms.

EFFECT OF PENICILLIN ON SULFONAMIDE RESISTANT AND SUSCEPTIBLE STRAINS

A total of 259 tests were performed on 55 sulfonamide resistant strains, and 132 tests were carried out on 27 sulfonamide susceptible strains. The accompanying table represents the inhibitory effect of the various penicillin dilutions on susceptible and resistant strains. It became obvious that with a 1:10,000 dilution of penicillin all of the sulfonamide susceptible and sulfon-

The laboratory work was aided by a grant from the United States Public Health Service.

From the Gonococcus Research Bureaus of Laboratories and Social Hygiene, Department of Health, City of New York.

The penicillin was provided by the Office of Scientific Research and Development from supplies assigned by the Committee on Medical Research for experimental investigations recommended by the Committee on Chemotherapeutic and Other Agents of the National Research Council.

1. Fleming, A.: On the Antibacterial Action of Cultures of a Penicillium, with Special Reference to Their Use in the Isolation of B. Influenzae, Brit. J. Exper. Path. **10**: 226, 1929. Hobby, G. L.; Meyer, K., and Chaffee, E.: Activity of Penicillin in Vitro, Proc. Soc. Exper. Biol. & Med. **50**: 277, 1942. Herrell, W. E.; Cook, E. N., and Thompson, L.: Use of Penicillin in Sulfonamide Resistant Gonorrheal Infections, J. A. M. A. **122**: 289 (May 29) 1943.

2. The penicillin used in these experiments was made available to us through the courtesy of Charles Pfizer & Co., New York. It was packaged in ampules each containing approximately 8,800 Oxford units.

3. Cohn, A., and Seijo, I.: Further Observations on the Correlation Between Clinical and In Vitro Reactions of Gonococcus Strains to Sulfathiazole, Am. J. Syph., Gonor. & Ven. Dis. **27**: 301, 1943.

amide resistant strains were killed off. However, as the dilution of the penicillin was increased, sulfonamide susceptible strains showed themselves to be relatively more inhibited by the antibacterial action of penicillin than sulfonamide resistant strains. For example, although a dilution of 1:200,000 killed off 53 per cent of the susceptible strains, it acted against only 38 per cent of the resistant strains tested with this dilution.

VARIATIONS IN INDIVIDUAL STRAINS

The susceptibility of different strains to penicillin was found to vary strikingly, so that some strains survived in a dilution which killed off most of the others and vice versa. A similar observation became evident in our clinical study on sulfonamide resistant gonococcic infections in female patients.[4]

COMBINATION OF SUBTHERAPEUTIC DOSES OF PENICILLIN AND SULFATHIAZOLE

Two sets of experiments were carried out, as follows: In the first, 11 sulfonamide resistant strains were grown in bloods containing both 3 mg. per hundred cubic centimeters of sulfathiazole and penicillin in a dilution of 1:200,000 or 1:500,000. In the second experiment 3 resistant strains were first grown in these same dilutions of penicillin for twenty-four hours and then transferred to blood containing 3 mg. per hundred cubic centimeters of sulfathiazole. The growth of the gonococcus strains was not affected in either of the two experiments.

These observations lend further support to the current assumption that the two antibacterial agents attack the organisms in different ways.

DELAYED ADDITION OF PENICILLIN

While in previous experiments the drug effect was studied by adding drug and organisms simultaneously to the blood, the effect of penicillin added after the gonococcus strains were already growing for twenty-four hours was tested in a small series of experiments. The inhibitory effect of two penicillin dilutions (1:10,000 and 1:100,000) respectively on sulfonamide susceptible and resistant strains was found to be about 15 to 20 per cent less than when drug and organisms were added simultaneously.

ADDITION OF PARA-AMINO BENZOIC ACID TO PENICILLIN

The effect of para-amino benzoic acid added to various penicillin dilutions was studied, but no consistent results could be obtained. In the majority of tests performed (forty-two) the antibacterial action of penicillin against both types of strains was the same in the penicillin blood alone as in the penicillin blood containing para-amino benzoic acid. In seventeen other tests an increase of the antibacterial action of penicillin became apparent, while in six others a decrease of this action was noted.

AGE OF PENICILLIN SOLUTION

Tests were carried out to determine if the aging of stock solution of penicillin kept in the icebox at 4 C. would weaken the in vitro potency of the antibacterial action of penicillin against the gonococcus. The inhibitory effect of serial penicillin dilutions of 1:10,000 to 1:1,000,000 prepared from these stock solutions was tested at weekly intervals for four weeks. The results indicate that, under the conditions mentioned, no essential variation of the potency of the various penicillin dilutions during this interval became noticeable.

SUMMARY

1. In a 1:10,000 dilution of penicillin representing 0.176 Oxford Unit per cubic centimeter all of the sulfonamide susceptible and resistant gonococcus strains were killed off.

2. With increasing dilutions of penicillin, sulfonamide susceptible strains were relatively more inhibited than sulfonamide resistant strains.

3. The susceptibility of different strains to penicillin varies strikingly in different dilutions.

4. The growth of sulfonamide resistant strains was not affected by the combination of "subtherapeutic" doses of penicillin and sulfathiazole.

5. The addition of para-amino benzoic acid to various penicillin dilutions did not yield consistent results as to the growth effect on the gonococcus strains.

6. The antibacterial action of dilutions of penicillin obtained from stock solutions which were kept for four weeks at icebox temperatures and tested at weekly intervals did not reveal any essential variation of its potency.

Effect of Penicillin on Sulfonamide Resistant and Sulfonamide Susceptible Gonococcus Strains

Dilution of Penicillin			1:10,000		1:100,000		1:200,000		1:500,000		1:1,000,000	
Type of Strain	Total Number of Strains Tested		+	0	+	0	+	0	+	0	+	0
Resistant	55	Number	20	..	50	3	11	18	4	37	..	56
		Per cent	100	..	94	6	38	62	10	90	..	100
Susceptible	27	Number	14	..	26	..	9	8	5	12	1	13
		Per cent	100	..	100	..	43	47	30	70	7	93

+ = Antibacterial action. 0 = No bacterial action.

Room 1020, 125 Worth Street.

4. Cohn, A.; Studdiford, W. E., and Grunstein, I.: Penicillin Treatment of Sulfonamide Resistant Gonococcal Infections in Female Patients: Preliminary Report to be published.

Medical Science and Irrational Fears.—In the matter of freedom from the fear of many epidemics, such as smallpox, the black death, yellow fever, diphtheria and typhoid, medical science has largely conquered helpless and irrational fear. Today fears of cancer, poliomyelitis, heart disease are widespread, but when their causes are more fully and generally known irrational fears will be relieved, even if their prevention and cure have not been solved. For example, in the epidemic of infantile paralysis in 1916 many towns and villages established shotgun quarantine against all transportation of persons under 16 years of age. In the 1890's similar quarantines were set up against all persons coming from yellow fever districts. Medical science has in large part removed such irrational fears even if it has not established unfailing cures of these diseases or means of their prevention. We fear most those things which are mysterious, "the pestilence that walketh in darkness," the causes of which are unknown.—Conklin, Edwin G.: "The Doctor's Dilemma" of Medical Ethics in Peace and War, *Science* **99**:187 (March 10) 1944.

Clinical Notes, Suggestions and New Instruments

A RAPID TREATMENT FOR SCABIES

LIEUTENANT (jg) ALBERT H. SLEPYAN, MC-V(S), U.S.N.R.

Scabies, by its annoying and distracting itch, is the source of considerable wartime disability. All modern methods of treatment of scabies have as their ultimate aim the use of a substance easily applied, rapidly lethal to mites and eggs and nonirritating to the skin. This aim is now an urgent wartime goal, since the saving of sick days means more men at more guns. It is with this purpose in mind that the procedures here described were instituted at the U. S. Naval Training Station, Great Lakes, and Camp McIntire Dispensary.

Kissmeyer [1] in 1937 reported on Nielsen's rapid ambulatory treatment for scabies. He used benzyl benzoate, soft soap (B. P. 1932) and isopropyl alcohol of each equal parts. In 1942 Mellanby and his associates [2] applied the benzyl benzoate lotion with and without the bath and found the treatment 100 per cent effective. They concluded that benzyl benzoate was rapidly lethal to mites, which are killed within five minutes of contact away from the body. Roxburgh,[3] making use of the newer wetting agents, using a 25 per cent solution of benzyl benzoate as an emulsion in water, using 2 per cent Lanette Wax SX. From the materials readily available the type of lotion presented in table 1 was derived and found most suitable.

The benzyl benzoate is gently poured over the Duponol C in the bottom of a jug.[4] To this the 2.5 per cent aqueous solution of bentonite is added slowly without shaking. The emulsion is then agitated until all of the wetting agent is dissolved.

TECHNIC

On admission to sick bay the following routine was followed:

1. Remove all clothing, put in bag, either autoclave or send to laundry.

2. Shower, using soap freely. Scrub, with particular attention, the involved areas.

3. Paint entire body from ear-chin line down, covering all folds of body. Use paint brush with long firm bristles.

4. Let dry on skin. Repeat painting in five minutes.

5. Put to bed. Cover with at least two blankets, or sufficient to make patient warm. Keep in bed for four hours.

6. Shower, dry well. Apply calamine ointment if any irritation is noted.

7. Clean clothes.

8. Return to duty with instructions to patient to report for follow-up examinations.

Before the formula and technic were arrived at, the patients (group 1) were painted with equal parts of benzyl benzoate, soft soap, alcohol and water. Each patient was given three paintings at four hour intervals, put to bed for four hours, showered and sent to duty. This treatment, although 100 per cent effective, in all those followed fourteen days or longer, was disagreeable in several respects. The paintings were associated with considerable smarting and burning and a varying degree of irritant dermatitis, most bothersome about the scrotum, which appeared shellacked after the first painting, resulting in desquamation of the skin of the penis and scrotum by the end of the tenth day.

Two patients who complained of swelling and edema of the penis required treatment with cold wet packs for a day before being fit for duty.

It was apparent that the alcoholic soap mixture produced too much post-treatment pruritus. A lotion making use of a wetting agent as an emulsifier [3] was then tried (table 1).

Patients (group 2) were treated with the same routine as group 1. Smarting and burning were conspicuously diminished with this lotion. Although the post-treatment irritant dermatitis was diminished there was considerable dryness of the skin, particularly of the thighs, upper arms, lateral sides of the abdomen and the scrotum, necessitating soothing emollients at night. When this routine was found as effective as that of group 1, a third group, group 3, was started on a five hour routine. This proved most satisfactory. The irritant dermatitis was minimal and the efficacy was maintained (table 2).

In all three groups the patients were observed routinely on the third, seventh and fourteenth days after treatment. Those with simple pyodermic lesions were treated as for uncomplicated scabies. Most all of those cases responded to the paintings without further treatment; a few were given a 3 per cent ammoniated mercury ointment for several nights.

TABLE 1.—*Lotion*

	Gm. or Cc.
Benzyl benzoate	250
Duponol C	20
Aqua bentonite	sufficient to make 1,000

TABLE 2.—*Results*

	Group 1	Group 2	Group 3
Number of patients treated	115	55	216
Number observed at least 14 days	44	35	68
Number observed at least 21 days	28	4	10
Median of days observed	19	15	17
Number of recurrences of symptoms	none	none	none

It is noteworthy that a goodly number observed between the fourteenth and twenty-eighth day exhibited relics of the infestation; namely, involuting papules, crusts, scars and pigmentation. These residuums at times superficially suggest recurrences; however, repeated potassium hydroxide preparations were negative. Further observation substantiated the fact that only the relics remained.

Four men were seen on the third day after treatment complaining of isolated new vesicles appearing on the webs of the fingers. A vesicle was removed and a sodium hydroxide preparation was examined. In each instance an egg was found undergoing what appeared to be fatty degeneration. The capsule was well defined, while the contents contained pycnotic, mosaic-like dark masses. Several of the vesicles were marked and observed on the tenth day and found dried and no longer pruritic. The parasitic remains found in scraping these areas were further shrunken.

Two patients were concurrently infected with pediculosis pubis. One of them had involvement of the axillary and abdominal hair. The treatment was gratifying in stopping the itching. No live pediculi could be found after the treatment. On the third, seventh and fourteenth day visits nits were plentiful but could be easily slid off the hairs. Twenty-one days after treatment there were no signs of parasitic infection. It was interesting to note that under the microscope the pediculus was killed almost immediately on being engulfed with a drop of the scabies lotion.

This article has been released for publication by the Division of Publications of the Bureau of Medicine and Surgery of the U. S. Navy. The opinions and views set forth in this article are those of the writer and are not to be considered as reflecting the policies of the Navy Department.

1. Kissmeyer, A.: A Rapid Ambulatory Treatment of Scabies, Lancet **1**: 21 (Jan. 2) 1937.
2. Mellanby, K.; Johnson, C. G., and Bartley, W. C.: Treatment of Scabies, Brit. M. J. **2**: 1 (July 4) 1942.
3. Roxburgh, A. C.: Treatment of Scabies, Practitioner **149**: 228 (Oct.) 1942.
4. Duponol C is obtainable from E. I. du Pont de Nemours, Wilmington, Del. This product contains several alcohol sulfates, chiefly lauryl sodium sulfate, some myristol sodium sulfate, cetyl sodium sulfate and stearyl sodium sulfate.

SUMMARY

A clean, simple, nonirritating five hour treatment for scabies has been developed. The time of the treatment has been reduced and the efficacy maintained. The use of benzyl benzoate as a scabicide is well established. Of the 189 patients followed longer than fourteen days, no recurrences were noticed.

The lotion presented suggests further trial on patients with pediculosis pubis.

ARTERIOVENOUS ANEURYSM RESULTING FROM APPLICATION OF ROGER ANDERSON SPLINT

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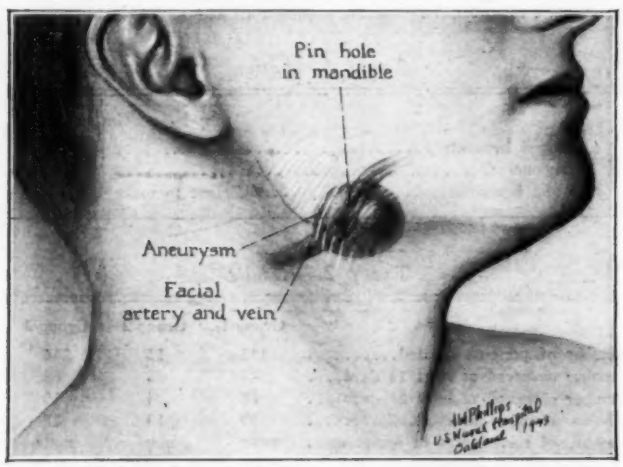
AND
LIEUTENANT ALBERT H. THRONDSON (DC), U.S.N.R.

While it is admitted readily that the use of external pin fixation has a definite place in the management of fractures of the mandible, certain potential complications in its technical application may be overlooked. A patient recently under our care demonstrates a complication that we feel should be recorded.

A man suffered an oblique fracture through the right angle of his mandible. An early reduction was performed and the teeth were wired in occlusion. Because the mandible was edentulous posteriorly a Roger Anderson external pin fixation splint was substituted to stabilize the posterior fragment in the reduced position. The wires were removed after partial union to permit early motion and use.



Location of thrombotic arteriovenous aneurysm.

At the time of application of the splint, one of the pins accidentally injured the underlying facial artery and vein. An immediate swelling developed that pulsated. The mass grew quickly to the size of a walnut. Pulsation continued for about one month, following which the mass gradually solidified but remained approximately the same size.

The splint was removed six weeks after application with evidence of good union at the fracture site. Three weeks later the tumor was explored. A thrombotic arteriovenous aneurysm was encountered, which was removed by resection between the ligated proximal and distal ends of the facial artery and vein. An uneventful convalescence followed its removal.

We feel that thoughtful preoperative planning will readily eliminate the likelihood of the future occurrence of this complication in the management of mandibular fractures. It should also be pointed out that the same principles should be observed in using external pin fixation apparatus in the treatment of fractures elsewhere in the body.

From the U. S. Naval Hospital, Oakland, Calif.
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Special Article

AMERICAN HEALTH RESORTS

THALASSOTHERAPY

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These special articles on spa therapy and American health resorts were prepared under the direction of the Committee on American Health Resorts. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the committee. These articles may be published later as a Handbook on Health Resorts.

Thalassotherapy is the utilization of ocean climate in preventing and treating disease.

Like many other sciences, it has gone through several phases of development from the empirical to the present day objective analytic research. The old Greek and Roman curators administered sea water as a laxative and used it in skin diseases. There are a few vague statements in Hippocrates as to the effectiveness of its external application in the form of showers and affusions; Plinius, Avicenna and later Savonarola made passing reference to the therapeutic use of sea water.

Richard Russell of England was the first to advocate sea bathing as a form of treatment in the mideighteenth century; fortunately he was able to persuade the reigning monarch to submit himself to "the cure." As a result, Brighton mushroomed as a fashionable seaside resort. In 1791 the Royal Sea Bathing Hospital was founded in Margate, England. Following the English rediscovery of therapeutic ocean bathing, colorful one man crusades for its general adoption were led in Europe by Barellai of Italy, Petrochaud of France and Benecke of Germany. These were the founding fathers of thalassotherapy, brought to its height of development in recent years by Haeberlin,[1] Kestner,[2] Krauel, Schaede[3] and their co-workers in Germany.

In prewar Europe, hundreds of seashore sanatoriums with thousands of beds were located along the irregular coast line of Europe. Belgium, a small country with a seashore line 40 miles long, had over forty sanatoriums with 3,500 beds—a sanatorium on each mile of the seashore. The United States with 6,000 miles of coast line boasts but three noteworthy institutions—one each in Connecticut, New York and New Jersey.

An estimated 20 million people each year use the American seashore as a vacation ground without any planned climatic exposure or supervised daily regimen. This presents remarkable potentialities for future scientific development.

In order to discuss climatotherapy scientifically one must get acquainted with (1) the physical properties of the climate, (2) their biologic effect on the human organism and (3) their controlled application.

1. Haeberlin, Carl: Heilquellen und Heilklima, Steinkopf Verlag, 1934, pp. 190-199.
2. Kestner, O.: Handbuch der normalen und pathologischen Physiologie **17**: 498, 1926.
3. Schaede, E.: Lehrbuch der Meeres Heilkunde, Berlin, Urban & Swarzenberg, 1935.

CLIMATIC PHYSICS

Climate is the sum total of meteorologic phenomena that characterize the average state of the atmosphere; it is a long range view on weather. Geographically, one distinguishes between arctic, temperate and tropical climates. Of geologic importance are high altitude, desert and seashore climates.

The vicinity of the ocean may have an influence on weather changes in an area extending 50 miles or more inland (maritime zone). In a smaller zone (up to 4 to 6 miles inland) the cooling effect of sea breezes can be generally felt (marine zone). Biologically the most important area is the vicinity of the beaches 50 to 100 yards from the water line. The latter, called the pelagic zone, is the one in which all the seashore climatic factors are most effective.

The three leading seashore climatic factors, each a complexity in itself, are air, sun and water.

Air.—"The sea air should be looked upon as remedy in itself," says Churchill's Medical Directory. "How a change of air can profoundly modify breathing, circulation, metabolism, cannot at present be explained, but many delicate children and invalids are as sensitive to the quality of air as are plants."

TABLE 1.—*Pollen at Mitchel Field and at Long Beach*

	Mitchel Field, L. I.	Distance 12 miles	Long Beach, L. I.
5,000 feet	6 pollens		33 pollens
4,000 feet	32 pollens		26 pollens
3,000 feet	28 pollens		12 pollens
2,000 feet	96 pollens		34 pollens
1,000 feet	74 pollens		97 pollens
750 feet	128 pollens		42 pollens
500 feet	116 pollens		102 pollens
250 feet	84 pollens		22 pollens
24 hour ground exposure	36 pollens		17 pollens

A satisfactory explanation of this statement can be found in an analysis of the qualities of sea air:

1. High oxygen content: 20.99 against 20.76 per cent in the continental air.

2. Relative freedom from dust, pollen, allergens, carbon monoxide and gaseous products of combustion.

3. High barometric pressure.

The sea breeze is an important feature of the summer along the seashore. It is a wind aroused and maintained by the difference of temperature between the inland and the ocean surfaces. It reduces the daily fluctuation of temperature by moderating the midday heat. It reaches shore in the middle of the forenoon with a velocity of 10 to 40 miles per hour and reduces the midday heat by 10 to 15 degrees Fahrenheit. It whips away fine, minute water particles from the crests of the waves breaking on the sand bars of the seashore. It carries this mist, containing chlorides, bromides, iodides in traces, about 50 to 100 yards inland (pelagic zone). The sea breeze maintains a sufficient degree of humidity, which seldom exceeds 75 per cent. The sea breeze is a powerful natural air conditioning mechanism of the seashore, purifying the air, producing desirable thermal equability and maintaining a convenient degree of humidity.

The iodine content of the sea air was determined on several occasions in Long Beach, N. Y., by a test sensitive to 10 micrograms per hundred cubic centimeters of iodide present. Filter papers which were exposed to the sea breeze in a circular frame 8 inches in diameter contained 0.374 to 0.778 mg. of iodides at the end of twenty-four hours. The amount of iodides varied according to the heaviness of the surf and according to the velocity of the oceanic breezes which whip away fine sea water droplets from the wave crests. This phenomenon is a plausible factor in the apparent rarity of endemic goiter at seashores.

The pollen distribution in different air strata was determined above Long Beach, L. I., and Mitchel Field, L. I., on Sept. 22, 1936 with five minute airplane exposures. The results are shown in chart 2 and table 1.

Sun.—There is a distinct difference in the qualities of sunshine on seashores as compared with sunshine elsewhere. This difference is caused by the reflection of radiation from the water surface and the beach sand.

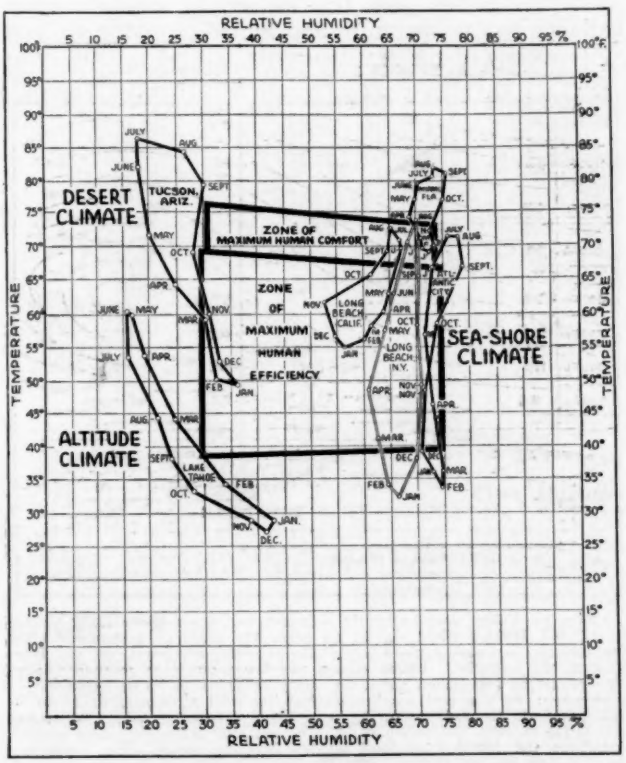

Chart 1.—Comparative climatogram. The climatogram, which covers all possible combinations of temperature in degrees Fahrenheit and relative humidity (per cent saturation), has projected on it the zone of maximum human comfort and the zone of maximum human efficiency. Silhouetted against these zones are the monthly temperature averages and the humidity averages of different localities representative of different climatic types. Characteristic types of climate represented are: Seashore climate: (*a*) Northern temperature: Long Beach, N. Y.; Atlantic City, N. J. (*b*) Southern temperature: Long Beach, Calif. (*c*) Subtropical: Miami, Fla. Desert climate: Tucson, Ariz. High altitude climate: Lake Tahoe, Nev.

The wide open spaces on the shore allow the full action of skylight radiation, which on partly cloudy days exceeds the amount of direct radiation. Campbell gives the same importance to the radiation from the ocean surface—the sea shine. Sandy beaches also produce reflex glare.

The humidity of the atmosphere does not weaken the biologically important wavelengths around 300 millimicrons, nor are they much lessened by dust, soot or oxidizable organic matter in the relatively pure air masses above the ocean. Quite the opposite happens to the rays arriving in longer wavelengths. Infra-red

rays are decidedly swallowed by the humidity. It is due to this phenomenon that the solar radiation of seashores is relatively cooler than the sunshine of high altitudes, which penetrates only dry air masses and loses little of its infra-red content. The mountain sunshine forewarns of ultraviolet damage by its warmth; the ocean sun fails to do so (Phillips).

Water.—Sea water is a compound salt solution of 2 to 4 per cent concentration containing mainly sodium chloride and potassium. It also contains magnesium, calcium, bromide, iron, phosphate, iodine, arsenic and strontium in traces. As it has been proved that no absorption of these mineral contents occurs, even with prolonged bathing, the effects of sea bathing must be attributed to (1) the temperature of the water, (2) the difference between the temperature of the skin and that of the water, (3) counterirritation of the skin by the salt content of the water, (4) mechanical stimulation by the waves of the surf, (5) degrees of exposure after bathing, (6) temperature and humidity of the air and (7) velocity of the sea breeze.

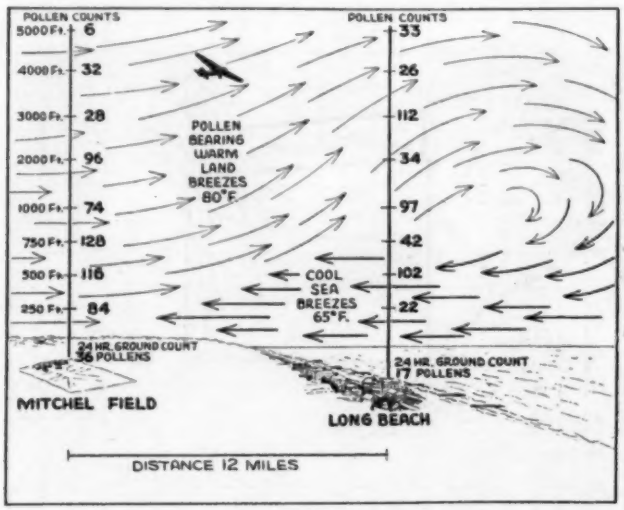

Chart 2.—Pollen distribution in different air strata above Long Beach, L. I., and Mitchel Field, L. I., on Sept. 15, 1936, as determined after five minute airplane exposures. Pollen counts are lower on sea level than in the altitudes. Pollen counts are lower on seashore than inland. The relatively low pollen count on sandy seashores is to be explained in four ways: 1. The cool sea breeze, blowing with a velocity of 12 to 18 miles, deflects the pollen bearing warm land breezes to higher altitudes; this is the chimney phenomenon. 2. The sea mist above the ocean surface completes the filtering of land burden breezes, which after depositing their pollen burden far out into the ocean return in the form of sea breezes. 3. There is a scarcity of vegetation on sandy beaches. 4. Flat seashores usually have marshy backgrounds without pollen-producing vegetation.

Minor Factors.—There are several minor factors cooperating in the marine cure—for instance, the iodine content of the air and the drinking water. The minor climatic factors, as the somewhat increased oxygen content of the air, the ozonization and the increased negative ionization, seem to be negligible, but one must consider that during a sojourn of eight to twelve weeks at the seashore the system constantly is exposed to the simultaneous effects of these factors.

CLIMATIC BIOLOGY

The biologic effect of a climate on the human organism depends mainly on its heat absorbing capacity. This heat absorbing capacity (expressed in calory square centimeter minutes) is influenced by a complexity of coeffective factors in the atmosphere. These factors are temperature, humidity, winds, barometric pressure and sunshine intensity.

Fundamentally, climatotherapy is the planned and supervised exposure to an atmosphere with a heat absorbing capacity different from that of the original habitat. This is reinforced by judicious application of heliotherapy and hydrotherapy.

Every human being has his own individual comfort zone within the range of which while resting and normally clothed he does not perspire and is not chilled. He feels comfortable when his production of heat is in equilibrium with the heat absorbing capacity of the environment.

If the heat absorbing capacity of the seashore is higher than that of the habitat of the person arriving, the climatic change will have a stimulating effect; if it is lower, a sedative effect.

The biologic effects of a stimulating climate result in increased conservation of heat and increased production of heat. This is effected by heightened cutaneous vascular tone and elevation of the basal metabolic rate. Sedative climates produce the opposite: vasomotor and metabolic relaxation.

Cutaneous Effects.—Life in cities, with its lack of exposure to open air and sunshine, and the heating and clothing of modern life harm the physical heat regulation. The skin becomes "domesticated." It loses its faculty for dodging sudden intensive changes in temperature by tonic contraction of the blood vessels of the skin—the physical regulation of heat. This mechanism has to render the well reacting skin similar to a poorly heat conductive leather coat. On confronting sudden changes of temperature the blood vessels of the domesticated skin give up their tone, the inner temperature drops, the person shivers and may catch cold. More than 50 per cent of the children newly arrived at the seashore react in this manner; after only six weeks at the seashore, less than 25 per cent. The lost regulation of heat is regained. The skin becomes acclimated, hardened. The temperature of the skin of these hardened children drops sharply, while their rectal temperature stays constant or increases after a sea bath.

The ice cube test reliably reflects the improvement in the thermic reacting ability of the skin during acclimatization.

The pigment changes (tanning) and the ergosterol production of the skin under the influence of solar exposure are well established facts. Histamine-like substances produced by the skin increase in the blood stream on exposure to cold. Their plausible purpose is to counteract the initial rise in blood pressure on the sudden dip in environmental temperature (open air exposure, bathing).

Effects on Mucous Membranes and Respiration.—The dust, soot and acrid impurities of the city air are missing at the seashore. which undoubtedly lowers the bronchiolar contraction, a reflex maintained by vagus effect. The relatively high degree of humidity in the sea air eases the activity of the ciliary epithelium in removing mucus and impurities. As a result, the flat, rapid breathing of the city dweller becomes deeper and slower. The vital capacity of the lungs of city children observed on seashores (Haeberlin, Singer) increased by about 500 cc. and the chest expansion up to 1½ to 3 inches after a two months vacation at the seashore.

First to be affected by external stimulation, the skin and mucous membranes represent the "receptor" organs of climatic change. The "conductors" of environmental influences from the skin and the mucous linings to central organs (the hemopoietic system and the

endocrine system) are the autonomous nervous system and the blood.

The existence of autonomous imbalance, the prevalence of vagotonia in domesticated newcomers at the seashore, the shift toward sympathicotonia after a few weeks of climatic stimulation can be demonstrated by biologic tests and by pharmacodynamic methods such as the oculocardiac reflex, Erben's test, the epinephrine pressor effect and the modified Muck test.

The role of the main regulator, that of "the pacemaker" controlling the process of acclimatization, has to be conceded to the endocrine system.

The sojourn at temperate seashores in the summer and fall and at southern shores in the winter and spring has a sedative effect. Open air exposure and especially ocean bathing sharply increase the metabolic rate and have to be considered stimulating. To illustrate this statement, the production and consumption of energy in some common occurrences at the seashore will be expressed in calories:

1. The energy producing level of an adult resting lightly dressed in an environmental temperature of 20 C. (68 F.) is about 100 kilocalories per hour.

2. The same person produces about 300 kilocalories per hour, walking with a speed of 4 miles per hour.

3. A 12 mile sea breeze of 20 C. temperature would absorb about 300 kilocalories per hour from the skin of the same (undressed) adult. He would shiver soon if vasoconstriction of the skin did not protect him.

4. As the heat conductivity of the water is twenty-three times as much as that of the air, ten minutes bathing would absorb about 400 kilocalories from the body if prompt vasomotor reaction of the skin did not sharply reduce this loss of heat.

Besides this easily demonstrable metabolic increase governed by the thyroid gland there are several other observations to indicate accentuated activity of the endocrine system; for example:

(*a*) Relatively sporadic occurrence of goiter at seashores.

(*b*) Latent toxic goiters becoming manifest as a result of excessive exposure to highly stimulating climatic effects.

(*c*) Delayed menses in young girls on climatic change (Haeberlin).

(*d*) Spontaneous improvements in the dysmenorrhea of adult females often encountered on seashore vacations.

(*e*) Fluctuations of the blood sugar level of the healthy adult in the first few weeks on seashore.

(*f*) Increased hexosuria in diabetic persons after prolonged ocean bathing.

Hematologic Changes on Climatic Stimulation.—Changes in the blood during thalassotherapy reported by German,[2] French [4] and Italian [5] observers are somewhat contradictory. From their data reinforced by the observations of one of us (Singer) on a large group of children and on healthy adults the conclusions given in table 2 can be drawn.

During the first few weeks of a seashore sojourn, especially with exposure to air and surf bathing, definite hematologic changes can be observed with apparent regularity (acclimatization phase). In case of overexposure to cool air and with prolonged and frequent ocean bathing this blood change will become exaggerated and will be accompanied by headache, malaise, nervous irritability, loss of sleep and appetite, and by a possible flare-up of dormant chronic inflammations (negative phase, supersaturation, bath reaction).

Complete acclimatization is noted by a reversal of the hematologic findings of the first few weeks of climatic therapy. An increased stability in cell count and blood chemistry characterizes this postacclimatization phase. Even excessive exposures will fail to elicit a negative phase at this stage of sojourn (stabilization phase).

THALASSOTHERAPY

Rationale.—Medically we distinguish two types of climate: the stimulating and the sedative or protective climate. We consider a winter climate of a given locality to be sedative if its mean monthly temperature is above 55 F., enabling an all year round outdoor existence. Floridian and southern Californian shores fulfill this requirement. A winter sojourn on any other

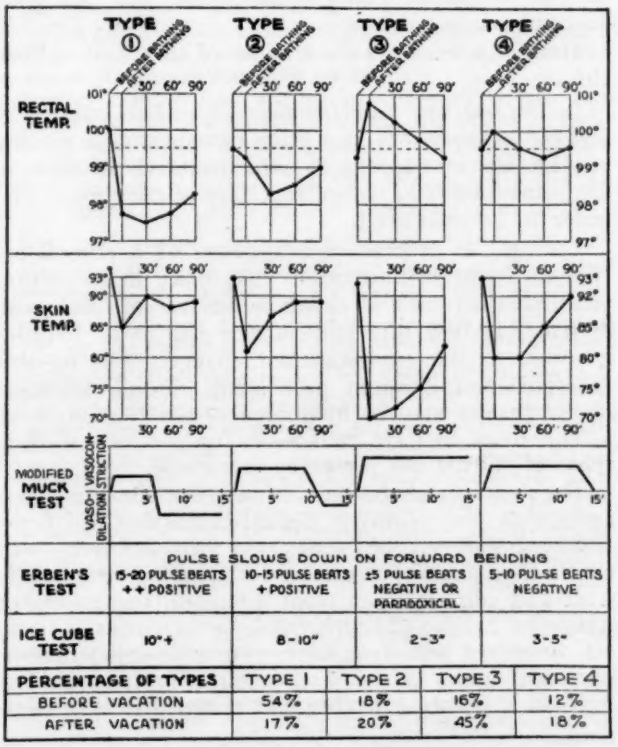

Chart 3.—Systemic reactions to thalassotherapy: Type 1. Failure of the physical heat regulation: Domestication; relative vagotonia. Type 2. Transitional reaction type: Partial loss of heat regulation. Type 3. Corrected heat regulation: Relative sympathicotonia. Type 4. Ideal form of reaction: High autonomous stability.

Modified Muck Test: A 1:1,000 epinephrine solution is applied topically by means of an atomizer on the lower turbinate and septum on one side of the nose. In the blanched area a mechanical irritation is caused by scratching the area on a ½ inch long line with a blunt sound. The consecutive reactions are timed and recorded. Typical preseasonal reactions: 1. Diffuse vasoconstriction (blanching) within thirty to sixty seconds. 2. Duration of vasoconstriction five to six minutes. 3. Reactive vasodilatation (reddening). 4. Red streak on the site of the mechanical irritation appearing usually one to two minutes earlier than the generalized vasodilatation. 5. Diffuse vasodilatation generally lasting more than ten minutes. Typical after-season reactions: 1. Diffuse vasoconstriction within a half-minute. 2. Duration of vasoconstriction ten minutes or more. 3. Occasionally a faint red streak starting at a later stage of observation. 4. Appearance of a white streak in the blanched zone, sometimes preceded by the aforementioned faint red streak. Persons displaying vasomotor rhinitis, hay fever and acute colds are not suitable subjects for this test. Whether this modified Muck test could be considered as a yardstick of the prevailing sympathicotonia and thus a possible indicator of the degree of the acclimatization cannot be definitely stated as yet.

Ice Cube Test: Delayed local hyperemia appearing later than ten seconds after two seconds' contact with an ice cube indicates poor thermic reacting ability of the skin.

American seashore is more or less stimulating. The summer on any seashore has protective, sedative qualities. Open air exposure and sun bathing are strong stimulating influences.

4. Piéry, M.: Traité de climatologie biologique et médicale, Paris, Masson & Cie **2**: 905-1001, 1934.
5. Sega, A.: Blood Changes in Marine Climate on the Adriatic, Riv. di idroclimat., talassol. e terap. fis. **48**: 333-338, 1937.

The two main forms of thalassotherapy are (1) a sojourn in an ocean climate by (*a*) a stay of six to eight weeks at the seashore or (*b*) a prolonged ocean trip; (2) selective utilization of climatic factors under partial or complete (institutional) supervision.

The modalities of thalassotherapy are (1) sun, air, surf bathing and outdoor exercise; (2) brine baths or concentrated sea water baths for the treatment of scrofulosis and chronic inflammation of the female pelvis; (3) baths in heated sea water; (4) baths and packs with sea mud (liman) for the local treatment of chronic arthritis and fibrositis.

Under medical supervision climatic therapy can be coordinated with or molded into any form of physical, medical or surgical therapy, for example: (1) a mineral water regimen in gastrointestinal disorders; (2) inhalation therapy in chronic bronchial conditions; (3) surgical and orthopedic management of bone and peritoneal tuberculosis on seashores.

Medical science does not know of an actual optimal climate.

Indications and Contraindications.—The indications and contraindications of a given climate vary according to (1) season, (2) age, condition and constitution of the patient and (3) nature and stage of the chronic disorder to be influenced.

During the process of adaptation to a stimulating climate extensive fluctuations take place in the neurovascular, chemical and endocrine balance of the human system. A new threefold balance has to be found—adaption to the environmental change. During this reorganization different preexisting chronic disorders of the system may be influenced—possibly eliminated.

The main biologic indications of the two medical types of climate are presented in table 3.

The majority of observers of seashore climatic effects agree that the following clinical conditions are beneficially influenced on seashores: In children: (1) chronic catarrhal processes of the upper respiratory tract and convalescence from influenza, pneumonia or whooping cough; (2) tuberculous involvement of cervical, bronchial and mesenteric glands and tuberculosis of bones, joints or the peritoneum; (3) constitutional imbalance (general debility and retarded development, exudative diathesis, hypothyroidism, rickets); (4) microcytic types of anemia; (5) functional digestive and nervous disorders, or vagotonia. In adults: (1) convalescence; (2) nervous exhaustion; (3) chronic inflammations of the upper respiratory tract; (4) asthma or hay fever; (5) surgical tuberculosis; (6) chronic arthritis. In aged persons: (1) arteriosclerosis and hypertension; (2) chronic arthritis; (3) chronic bronchitis.

TABLE 2.—*Changes in the Blood During Thalassotherapy*

	Acclimatization Phase, First 2 to 4 Weeks	Stabilization Phase, Post-acclimatization
1. Red cell count	Increase	Stable
2. Hemoglobin	Increase	Stable
3. White cell count	Increase	Decrease
4. Ratio: leukocytes to lymphocytes	Increase	Decrease
5. Eosinophils	No change	Decrease
6. Blood calcium	Increase	Decrease
7. Blood sugar	Increase	Decrease
8. Carbon dioxide combining power	Decrease	Increase
9. Sedimentation rate	Increase	Decrease

As to contraindications, there are practically none for sojourn at the southern seashores in any season. The same can be stated for temperate seashores in the summer and fall. The excessive stimulation present in the climate of northern shores, the strongly irritative factors in the stormy late winter of northern temperate shores and surf bathing on any shore or in any season are contraindicated in (1) pulmonary tuberculosis, (2) hyperthyroidism, (3) severe neurosis and vasomotor disorders, (4) peripheral vascular diseases, (5) severe myocardial damage and (6) acute and subacute arthritis.

TABLE 3.—*Indications of Two Types of Climate*

Climatic Sedation on Seashores	Climatic Stimulation on Seashores
The climatic sedation is a good protective therapeutic measure. Its chief indications are:	Its chief indications are a large array of chronic diseases whose correction requires:
1. Constitutional defects (a) In the feeble aged (b) In the delicate child	1. Stimulation of the hemopoietic organs 2. Increased basal and mineral metabolism 3. Improved breathing mechanism 4. More effective physical heat regulation
2. Debilitating diseases, especially in persons whose constitution displays vasomotor or endocrine instability (a) Rheumatic heart disease (b) Chronic nephritis (c) Rheumatoid arthritis	To be effective, climatic stimulation must be optimal in amount, avoiding ineffective underexposure and harmful overexposure

Failures for thalassotherapy can be ascribed to (1) faulty selection of the place or of the season, (2) disregard of contraindications, (3) insufficient exposure to climatic influences, (4) overstimulation of supersaturation and (5) poor habits of living continued at the seashore.

The following few suggestions are offered to enable avoidance of some common mistakes: The sojourn in southern climates necessitated by cardiovascular diseases should be planned to last through the whole winter. On returning to the north, it seems to be advisable to reduce the abruptness of climatic change by a few days stay in the pine belt of the Carolinas or in Virginia. On the last three days of a short southern vacation, extensive exposure to solar radiation is inadvisable as the resulting erythema will interfere with the heat regulating vasomotor mechanism of the skin on returning to the north. The negative phase (supersaturation) can be controlled by two days of complete rest and 2 or 3 grains (0.13 to 0.2 Gm.) of quinine plus 5 grains (0.32 Gm.) of bromides administered three times daily.

Thalassotherapy can be utilized to its optimal advantage only by cooperation between the physician of the city and the physician at the seashore. Whether climatic stimulation or sedation is needed, the family physician is the one who most probably will have to select the new climatic environment. In so doing he has to take into consideration the condition, the constitution and the social and financial background of the patient. One of his most important obligations to his patient is to provide him with the name and address of a reputable medical man on the site of the prospective vacation. Lastly he should provide the patient with a chart of the case history containing sufficient data to enable the recipient physician to comprehend the medical problem of the migrant. This medical identification card, this scientific passport will be useful in the vacational guidance, in the planning of therapy and in an emergency. The recipient specialist or general prac-

titioner should try his utmost to cooperate with the sender in acknowledging the arrival of the patient, giving his impressions of the case and outlining the therapy to be instituted. This friendly cooperation will enhance the after-care and will enable that long range planning which is so important in the treatment of the chronically sick. In this long range planning climatic therapy plays an important role.

Military and Public Health Importance of Thalassotherapy.—At a time when the utilization of every source of manpower is of extreme importance to the nation, thalassotherapy has a definite role in the war effort, first as an aid in military training through the "hardening" attained by surf bathing, second in the speedy rehabilitation of convalescent soldiers and third as an aid to bringing up to par persons with minor defects, i. e. secondary anemia, neurocirculatory asthenia and malnutrition.[6]

Southern seashores may play an important future role in the mass escape from the hardships of Northern late winter. Today's winter vacation is governed by vogue and hearsay evidence. Southern state authorities could build it up to a national institution by encouraging and supporting financially biologic investigations of the effects of these winter migrations.[7] Northern seashores in the summer are ideal grounds for medically supervised vacations of American children. Exposure to climatic hardships builds a strong race; hiding from them breeds weaklings.

Wind protected open air schools in the fall on the beaches of the northern part of the land would contribute greatly to build a future American youth fit for war and fit for peace.

SUMMARY

Thalassotherapy is the utilization of ocean climate in preventing and treating disease. Its main factors—sun, air and water—act by their influence on the skin and the mucous membranes as receptor organs. The blood and the autonomic nervous system are used as conductors of their effects; thereby acclimatization is achieved, with the endocrine system acting as a possible "pacemaker."

The rationale of thalassotherapy includes (*a*) a sojourn at the seashore (a stay of six to eight weeks) and (*b*) selective utilization of climatic factors under partial or complete (institutional) supervision. There are indications and contraindications for climatic stimulation and for climatic sedation.

Thalassotherapy is of military as well as public health importance.

6. Singer, C. L.: Climate and Military Preparedness, J. A. M. A. **115**:1421-1424 (Oct. 26) 1940.
7. Singer, C. L.: Medically Supervised Vocational Migrations, J. A. M. A. **112**: 904-907 (March 11) 1939.

First Statistical Study of Disease.—From France came the first statistical studies of diseases. Of course there had been statistics of births and deaths before this time, but the great Parisian clinician Pierre C. A. Louis (1787-1872) was the first to show the value of purely medical statistics. By collecting the records of numbers of cases of different diseases he was able to show convincing proof of the efficacy, worthlessness or disastrous results of their treatment. Thus he helped to stem the torrent of bloodletting in which Broussais and others indulged, for he brought forward figures to show that in pneumonia, at least, bleeding was worse than useless. To Louis belongs the credit of showing that statistics are an important adjunct to the advancement of medical knowledge.—Haagensen, C. D., and Lloyd, Wyndham E. B.: A Hundred Years of Medicine, New York, Sheridan House, Inc., 1943.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

METAMUCIL.—A mixture containing about 50 per cent of powdered mucilaginous portion (outer epidermis) of blonde psyllium seeds (Plantago ovata-Forsk) and powdered anhydrous dextrose, with sodium bicarbonate 0.2 per cent, monobasic potassium phosphate 0.25 per cent, citric acid 0.33 per cent and benzyl benzoate 0.04 per cent.

Actions and Uses.—Metamucil is intended as an adjunct in the treatment of constipation. It encourages elimination by the formation of a soft, plastic, water-retaining gelatinous residue in the lower bowel. The mucilloid is also claimed to have a demulcent effect in the presence of inflamed mucosa. Metamucil has been mixed with barium sulfate to obtain more uniform dispersion of the barium for x-ray visualization.

Dosage.—Four to 7 cc. one to three times daily, each dose thoroughly stirred in a glass of water and followed by an additional glass of liquid. Children receive proportionate amounts according to weight and age. It is important that adequate fluids be ingested to assure a soft bulk. Metamucil should not be used carelessly so that a state of dependency is reached.

Tests and Standards.—

Metamucil is a white to cream colored, slightly granular powder, possessing little or no odor and a slightly sour taste. A uniform suspension is formed when 10 Gm. of the powder is stirred rapidly into 250 cc. of water. As the hydration and swelling of the mucilaginous portion progresses, the mixture assumes a soft gelatinous consistency.

Place about 10 Gm. of metamucil in a dry 25 cc. glass stoppered graduate. Fill the graduate to the 25 cc. mark with a solution made by mixing 27 cc. of chloroform and 73 cc. of carbon tetrachloride. Stopper the graduate and mix the contents thoroughly. Set the graduate aside and observe the contents at the end of two hours: a light colored layer appears at the bottom of the tube, approximately equal in volume to a brownish colored layer which appears at the top of the tube. Mechanically separate the layers formed in the graduate and dry the material at 80 C.: powder from the lower layer is soluble in water and responds to tests for dextrose; powder from the upper layer forms a mucilage with water and is microscopically identical with fragmented material obtained from the outer epidermis of blonde psyllium seed (Plantago ovata-Forsk).

Transfer 50 Gm. of metamucil to a suitable flask and determine the moisture content by means of the method for moisture by toluene distillation described in the U. S. P. XII: the moisture content found is not more than 4 per cent.

Transfer exactly 20 Gm. of metamucil to a 150 cc. beaker, add 0.1 Gm. of decolorizing charcoal and 30 cc. of 80 per cent, v/v, ethyl alcohol preheated to 65-70 C. Stir the mixture thoroughly for three minutes and filter, while still warm, into a 50 cc. volumetric flask. Rinse the beaker twice with 7 to 9 cc. of warm 80 per cent alcohol and filter the rinsings through the residue on the filter paper, adding the washings directly to the volumetric flask. Cool to 25 C., add three drops of stronger ammonia water, fill to the mark with 80 per cent alcohol and mix the contents of the flask. Allow the mixture to stand for ten minutes and then determine the optical rotation of a portion of the solution in a 2 decimeter tube, using sodium light. Multiply the observed angular rotation by 21.7 to obtain the percentage of anhydrous dextrose present in the specimen taken: the amount of dextrose found is not less than 46 per cent nor more than 50 per cent.

G. D. SEARLE & CO., CHICAGO

Metamucil: 8 ounce container.

U. S. patent 2,095,259 (Oct. 12, 1937; expires 1954). U. S. patent 2,132,484 (Oct. 11, 1938; expires 1955), U. S. trademark 317,704 (Oct. 2, 1934).

SULFANILAMIDE (See New and Nonofficial Remedies, 1943, p. 175).

The following additional dosage form has been accepted:

LEDERLE LABORATORIES, INC., PEARL RIVER, N. Y.

Sulfanilamide Surgical Powder (Sterile): 5 Gm. puffer tube.

SULFATHIAZOLE (See New and Nonofficial Remedies, 1943, p. 182).

The following additional dosage form has been accepted:

LEDERLE LABORATORIES, INC., PEARL RIVER, N. Y.

Sulfathiazole Surgical Powder (Sterile): 5 Gm.

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SATURDAY, APRIL 15, 1944

METABOLIC ASPECTS OF SHOCK

The hemodynamic disturbances in shock originate new conditions for cellular respiration and metabolism. All tissues and systems of the body suffer from a deficient blood flow and oxygen supply. Long and his group [1] report a series of investigations of the factors responsible for the metabolic disorders in shock. The sensitivity of liver and kidney to the anoxia accompanying hemorrhagic shock was tested by comparing the rate of respiration of slices of liver and kidney from normal rats and from rats in progressively severe states of shock. While the kidney did not show significant depression in use of oxygen even in most severe shock, liver proved to be exceedingly vulnerable to the deprivation of oxygen. The consumption of oxygen by slices of liver from severely shocked rats was about three times lower than that from normal rats. The depression in rate of use of oxygen by liver was closely parallel to the degree of severity of shock. Many of the chemical changes in the blood observed during the state of shock could be ascribed to the functional damage of the liver. There was an inverse correlation between the rate of oxygen consumption of the liver and the rise in level of amino acids of the blood which occurs in severe hemorrhage. Since deamination is to a great extent limited to the liver, hepatectomized animals constitute an appropriate preparation for the analysis of the role that the rate of breakdown of protein plays in the elevation of amino acids in the blood. In eviscerated rats with shock, Long and his colleagues found that the rate of accumulation of amino acids in the blood was much higher than that of eviscerated control rats. This observation indicates that an increased breakdown of protein occurs in the peripheral tissues in shock. This affects mainly the muscles, which are, in addition to failure of the liver, responsible for the elevation of levels of nonprotein nitrogen and amino acids. Hence these levels may be used as an index of the damage suffered by the liver and muscles in shock.

The abnormalities in carbohydrate metabolism in shock were also studied by Long's group. While the blood sugar rises initially as a result of liberation of epinephrine as shown in adenodemedullated animals, in later stages of shock hypoglycemia of varying severity occurs. In hepatectomized shocked rats the rate of fall in blood sugar levels was distinctly greater than in the hepatectomized control rats. As the increased rate of utilization of glucose was associated with definite elevation of lactate and, to a smaller degree, of pyruvate, a shift from aerobic to anaerobic type of carbohydrate breakdown yielding less energy for molecule of glucose utilized was postulated.

Similar disturbances in carbohydrate metabolism had previously been reported by Govier and his colleagues,[2] who stressed the important role that the correction of the metabolic disorders may play in the therapy of shock. Thus dogs with a higher plasma level of thiamine were more resistant to the onset of shock than those with low thiamine in plasma. When thiamine was administered before bleeding, the blood pressure showed a constant tendency to return to normal after hemorrhage, enabling the animals to withstand more bleeding than the controls. Therapeutic administration of thiamine to dogs in which hemorrhagic shock had been induced prolonged significantly their survival time, as sugar, keto acids and lactic acid levels in the blood returned to normal.

These studies indicate the extreme importance of metabolic disorders in determining the course and outcome of shock. They also represent an important step in understanding the mechanisms responsible for shock and in correction of the abnormalities resulting from it.

1. Engel, F. L.; Winton, Mary G., and Long, C. N. H.: Biochemical Studies on Shock: I. The Metabolism of Amino Acids and Carbohydrate During Hemorrhagic Shock in the Rat, J. Exper. Med. **77**: 397 (May) 1943. Russell, Jane A.; Long, C. N. H., and Engel, F. L.: Biochemical Studies on Shock: II. The Role of the Peripheral Tissues in the Metabolism of Protein and Carbohydrate During Hemorrhagic Shock in the Rat, ibid. **79**: 1 (Jan.) 1944. Engel, F. L.; Harrison, Helen C., and Long, C. N. H.: Biochemical Studies on Shock: III. The Role of the Liver and the Hepatic Circulation in the Metabolic Changes During Hemorrhagic Shock in the Rat and the Cat, ibid. **79**: 9 (Jan.) 1944. Russell, Jane A.; Long, C. N. H., and Wilhelmi, A. E.: Biochemical Studies on Shock: IV. The Oxygen Consumption of Liver and Kidney Tissue from Rats in Hemorrhagic Shock, ibid. **79**: 23 (Jan.) 1944.

2. Govier, W. M., and Greer, C. M.: Studies on Shock Induced by Hemorrhage: I. Effect of Thiamine on Survival Time, J. Pharmacol. & Exper. Therap. **72**: 317 (Aug.) 1941; II. Effect of Thiamine on Disturbances of Carbohydrate Metabolism, ibid. **72**: 321 (Aug.) 1941. Govier, W. M.: III. The Correlation of Plasma Thiamine Content with Resistance to Shock in Dogs, ibid. **77**: 40 (Jan.) 1943. Greig, Margaret E., and Govier, W. M.: IV. The Dephosphorylation of Cocarboxylase in Tissues During Shock and Anoxia, ibid. **79**: 169 (Oct.) 1943.

VIRUS PNEUMONIA IN CATS

An infection of the respiratory tract in cats, variously called nasal catarrh, influenza or distemper, has been frequently observed in the Northeastern states. The main characteristics of this disease are sneezing, coughing and mucopurulent discharge from the eyes and nose. Although pneumonia usually cannot be demonstrated during life, necropsies often reveal grayish, densely consolidated areas in the anterior lobes. The disease is rarely fatal. The acute symptoms seldom persist for more than one or two weeks, although the debilitating after-effects usually last for over a month.

This pneumonic infection has been recently studied in detail by Baker[1] of the Department of Animal Pathology, Rockefeller Institute. Isolation of the causative agent was accomplished as follows: A 10 per cent emulsion of pneumonic tissues was prepared from sick cats, centrifuged for five minutes at 1,200 revolutions per minute and 0.05 cc. of the resulting supernatant fluid inoculated intranasally under light ether anesthesia into young mice. The mice became sick and usually died in from three to five days; necropsies showed a definite pneumonia, usually involving more than half of the lung tissues. Emulsions of these tissues were prepared in the same way as with the cat lungs and inoculated intranasally into other mice. In this way five strains of the cat infection have been established in mice. As a result of serial passage all five strains have increased in mouse virulence, death now occurring in two to three days after intranasal infection.

After the fifth and twentieth serial passages in mice the intranasal minimum lethal dose was determined for each strain. Groups of 5 animals each were then inoculated respectively with 10 minimum lethal doses intranasally, 10 intracerebrally, 50 intraperitoneally and 100 subcutaneously. All mice inoculated intranasally died in two to three days, while those inoculated by the three other routes did not develop signs of illness. Nevertheless the causative agent was present in suspensions of the brains of the mice inoculated intracerebrally and in the spleens of those injected intraperitoneally in sufficient quantities to give lethal pneumonia on intranasal instillation into other mice. Attempts to adapt the causative agent to extrapulmonary tissues by serial intracerebral or intraperitoneal passage gave negative results.

Although the mice inoculated intraperitoneally, intracerebrally or subcutaneously with the active suspensions did not develop signs of illness, they did acquire an almost solid specific immunity. Tested fourteen to twenty-one days later these vaccinated mice were fully resistant to intranasal instillation of massive doses of the infectious agent, control mice invariably succumbing to the infection.

Several groups of inoculated and noninoculated mice were placed together in the same cages. The inoculated mice were allowed to die before removal from the cages. Symptoms were not observed in the exposed mice, pneumonia was not found in half of the mice then killed for necropsy, and immunity could not be demonstrated in the remaining half, which were afterward tested by the intranasal route. The tests indicate that the disease is not readily spread by contact in mice, though contact transmission was readily demonstrable in cats.

A number of different animal species were tested for susceptibility to this infectious disease by intranasal instillation of doses roughly proportional to the body weight. Mice, hamsters and young guinea pigs were highly susceptible, all dying from the disease. Cats, rabbits and adult guinea pigs showed only a mild infection, from which all recovered, necropsies revealing only mild pneumonic lesions as contrasted with the massive pneumonias in the highly susceptible species.

Cultures on blood agar and other specialized mediums failed to demonstrate a cultivable agent, suggesting that the causative agent is presumably a virus. Films prepared from pneumonic lungs revealed structures similar to the cytoplasmic plaques or elementary bodies developing in tissue cultures of psittacosis virus.[2] The unknown agent was readily cultivated in the yolk sac of fertile hen's eggs,[3] where it also developed elementary bodies similar to those formed by the psittacosis virus. Centrifugation at 10,000 revolutions per minute for thirty minutes of suspensions containing both elementary bodies and the infective agent concentrated both the agent and the elementary bodies together. Both the infective agent and the elementary bodies failed to pass through a Berkefeld N filter. Complement fixation experiments using a suspension of partially purified elementary bodies as antigens gave positive results with the serums of recovered cats. These tests suggest that the elementary bodies are immunochemically identical with the virus.

Among Baker's clinically suggestive results are his tests of the possible viricidal action of immune cat serum. Although recovery serum gives positive complement deviation reactions with the elementary bodies, the serum is without demonstrable neutralizing effects on the virus. When inoculated intranasally into mice, the virus-serum mixtures are fully infective, suggesting that acquired immunity to the feline virus is due to cytologic rather than to humoral adaptations.

Tests of cats one to two months after full recovery showed that the virus was still present in infectious concentration in the nasal tissues. Inoculation of suspensions of ground nasal turbinates intranasally into mice gave lethal pneumonia. Cats that recover are demonstrably immune, since they do not show signs of reinfection when given multi-infective doses intranasally.

Numerous viruses have been previously described for cats. Lawrence,[4] Hammon[5] and others have reported a filtrable virus which produces fulminating leukopenia when injected intravenously. This virus, however, is not infective on intranasal instillation and is nonpathogenic for other animal species. The same virus had been previously described by Verge[6] and others[7] under the name of "cat enteritis." Two years ago

1. Baker, J. A.: J. Exper. Med. **79**: 159 (Feb.) 1944.

2. Bland, J. O. W., and Canti, R. G.: J. Path. & Bact. **40**: 231, 1935.
3. Cox, R. H.: Pub. Health Rep. **53**: 2241, 1938.
4. Lawrence, J. S., and Syverton, J. T.: Proc. Soc. Exper. Biol. & Med. **38**: 914, 1939.
5. Hammon, W. D., and Enders, J. F.: J. Exper. Med. **69**: 327, 1939.
6. Verge, J., and Christoforoni, N.: Compt. rend. Soc. de biol. **99**: 312, 1928.
7. Hindle, E., and Findlay, G. M.: Proc. Roy. Soc. Med. **26**: 197, 1933.

Blake [8] discovered a pneumonia virus in kittens which is also noninfectious for mice and does not produce elementary bodies. The conclusion is drawn that Baker's virus differs from all feline viruses previously described. Presumably it is not the only virus capable of producing nasal catarrh and nonlethal pneumonia in cats.

VAGINAL SMEARS IN CARCINOMA OF UTERUS

The death rate from carcinoma of the female genital tract, according to Dublin,[1] is approximately 32,000 per year in the United States; of this figure four fifths, or 26,000, of the deaths annually are due to cancer of the uterus. This rate has remained practically constant during the past twenty-five years. This is tragic, since early diagnosis and modern treatment produce a high percentage of cures in carcinoma both of the fundus of the uterus and of the cervix. Papanicolaou and Traut [2] point out that the present difficulty in early diagnosis is our great dependence on the subjective symptoms of the disease to bring the patient to the physician. By the time the patient becomes sufficiently aware of discomfort to seek help, the disease is far advanced. Even when the patient is seen early in the course of the disease, the technic for making a positive diagnosis is not simple, as it involves biopsy followed by the procedures necessary for microscopic examination, all of which are time consuming and relatively expensive. Hoge [3] questioned on admission to the hospital 91 patients in an effort to analyze the period of delay before treatment. On the average patients delayed four months before going to the doctor after the onset of symptoms, the doctor delayed three months before giving proper advice and there was another month of delay before treatment was begun.

Papanicolaou, after years of study of the normal and abnormal variations in the vaginal smear in women and in animals, became aware of the fact that carcinoma of the fundus of the uterus and carcinoma of the cervix are to some extent exfoliative lesions in the sense that cells at the free surface of the growth tend to become dislodged and subsequently to find their way into the vagina. He has developed a method for collecting the cellular débris, which is smeared on glass slides and stained in a particular way so that the various components may be studied. The method is simple and inexpensive and may be applied to large numbers of women. Papanicolaou states that cells pathognomonic of cervical and fundal carcinoma can be definitely recognized. The interpretation of smears calls for an intimate knowledge of the cytologic characteristics of the vaginal fluid.

Meigs and his associates [4] studied the vaginal smears taken from 220 patients. Smears were taken from 153 women either because they were in the cancer age or because they had symptoms of vaginal bleeding or discharge; of these, 79 had biopsy, curettage or hysterectomy with negative tissue diagnosis for cancer. The remainder of these patients with negative smears did not present enough evidence for malignant disease to require operative procedure. Cancer cells were not found in the smears taken from these women. A histologic diagnosis of uterine carcinoma was made in 62 cases, 46 being carcinoma of the cervix; 40 of these cancers were epidermoid. Of the 46 cases with proved cancer of the cervix, positive vaginal smear diagnosis was made in 45, a percentage error of 2.2. Ten cases, or 22 per cent, were classified as early cervical carcinoma. Of 12 cases of endometrial cancer, 11 were diagnosed by vaginal smear, a percentage error of 8.3. Of 153 negative cases, positive smears were reported in 4, an error of 2.6 per cent. A cancer cell can be more readily identified in the vaginal smear than in the body fluid sediments or in the sputum. This increased accuracy in diagnosis is probably due to the fact that the cells of the vaginal fluid are in greater concentration and have suffered less degeneration. These authors do not feel justified in advising operation for uterine cancer solely on the evidence of a positive vaginal smear. The positive smears should be confirmed by biopsy or curettage. They consider the method as of significant value. The need for a systematic study of the entire smear and an experienced knowledge of cytology are emphasized. The method of vaginal smear examination appears to be an important addition to the early recognition of uterine cancer.

Current Comment

LEUKEMIA IN PHYSICIANS

Leukemia may occur in workers with radiation under conditions like those in which carcinoma of the skin due to radiation can arise. Exposure to x-rays under experimental conditions favors the development of leukemia in animals. Since high energy radiations may play a part in human leukemia, workers in the National Cancer Institute [1] have compared the incidence of leukemia in physicians and in the general population on the basis of the death lists of physicians in THE JOURNAL, the mortality reports of the United States Bureau of the Census and an unpublished compilation of the United States Public Health Service. The ratio of deaths from leukemia to deaths from cancer, the ratio of deaths from leukemia to total death rates, and death rates from leukemia were studied with the result that leukemia "was recognized approximately

8. Blake, F. G.; Howard, M. E., and Tatlock, A.: Yale J. Biol. & Med. **15**: 129, 1942.
1. Dublin, L. I.: Cancer Problems, Symposium, 1937, p. 237.
2. Papanicolaou, G. N., and Traut, H. F.: J. Obst. & Gynec. **42**: 193, 1941.
3. Hoge, Randolph H.: Carcinoma of the Cervix: Time Lost Before Treatment, Virginia M. Monthly **69**: 200 (April) 1942.
4. Meigs, J. V.; Graham, Ruth M.; Fremont-Smith, M.; Kapnick, I., and Rawson, R. W.: The Value of the Vaginal Smear in the Diagnosis of Uterine Cancer, Surg., Gynec. & Obst. **77**: 449 (Nov.) 1943.
1. Henshaw, P. S., and Hawkins, J. W.: Incidence of Leukemia in Physicians, J. National Cancer Institute **4**: 339 (Feb.) 1944.

1.7 times more frequently among physicians than among white males in the general population." The result is in accord with the increase in the incidence of leukemia in animals exposed to x-rays. Whatever the full meaning of the data at hand may be, the hazards of radiation require the strict maintenance of complete protection at all times.

INADEQUATE DIETS AND NUTRITIONAL DEFICIENCIES IN THE UNITED STATES

The Committee on Diagnosis and Pathology of the Food and Nutrition Board has reviewed material reported in widely scattered journals on the state of nutrition of the people of the United States.[1] An appreciable percentage of diets fail to meet more than 50 per cent of the recommended daily allowances of the Food and Nutrition Board, but many more diets are deficient by less than 50 per cent. This widespread prevalence of more or less deficient diets is associated with a high incidence of deficiency states, largely mild in intensity and gradual in its course. The problem thus created is both preventive and corrective. For prevention, production of sufficient food must be maintained and better distribution is required; judicious enrichment of appropriate foods may be advisable, and dietary education should be intensified and extended. For correction there is need for skill in detecting deficiency conditions and improved procedure for the treatment of such conditions. There has been some exaggeration of the benefits of optimal nutrition and much exploitation of the vitamins. This has retarded the proper application of the science of nutrition. However, knowledge of the relation of nutrition to health is being rapidly uncovered. The evidence now available, incomplete though it may be, leads to but one conclusion: that "there is a real difference as measured in terms of growth development and general health record between optimum and just adequate nutrition; and that every practical effort should be made to apply this knowledge in the interest of human welfare."

ANTITOXIN IN PLANT MATERIAL

Discovery of a hitherto unsuspected antitoxic factor in numerous plant materials is currently reported by Woolley and Krampitz [1] of the Rockefeller Institute. The discovery was a by-product of research on the toxic properties of glucoascorbic acid, a homologue of ascorbic acid having the same structural relationship to dextrose that ascorbic acid has to xylose. Given by mouth, this homologue apparently "blocks" ascorbic acid synthesis and utilization in cotton rats and mice, causing the characteristic symptoms of scurvy as seen in animal species susceptible to that disease. Inhibition of the action of vitamins by closely related chemical homologues is not new, since "homologue blockade" is well established in bacteriology.[2] This, however, is the first demonstration of a similar phenomenon in higher animals. Woolley and Krampitz found that, when 5 per cent glucoascorbic acid is added to their routine highly purified basic diet, growth is inhibited in both rats and mice, followed by diarrhea, subcutaneous hemorrhages and rapid loss of weight, death usually occurring within three weeks. Oral or subcutaneous administration of ascorbic acid will not prevent or cure this scurvy-like syndrome. If, however, instead of 5 per cent glucoascorbic acid being added to the routine highly purified basic diet the same amount of the homologue is added to a mixture of natural rations, no scurvy-like symptoms develop. There is apparently some factor in natural plant materials that neutralizes or otherwise prevents "homologue toxicity." Dehydrated young grass was found to be the plant material of highest prophylactic or therapeutic value, with fresh cabbage a close second. The antitoxic factor in dehydrated grass is not destroyed by cooking.

CONSTITUTIONAL PRECOCIOUS PUBERTY

According to Novak,[1] genetic factors and endocrine mechanisms control the onset and development of the puberal processes. Precocious puberty and menstruation in females are more frequently dependent on an abnormal genetic constitution than on endocrine tumors or cerebral lesions acting by way of the hypothalamus and hypophysis. In the diagnostic search for the cause of precocious puberty, granulosa cell tumor of the ovary is considered as the first and most likely possibility. However, this tumor has been shown to be an extremely rare condition. In more than 60,000 patients examined in the Johns Hopkins department of gynecology only 1 instance of granulosal ovarian tumor was registered. Constitutional precocious puberty, in which the early development of the puberal phenomenon is not produced by any demonstrable underlying pathologic change, is considered by Novak the commonest form of precocious puberty. This author reports 9 cases of this syndrome in which tumor of the ovaries, adrenals or pituitary could not be demonstrated. A careful follow-up of these patients failed to detect any evidence of endocrine disturbances, neoplastic growth or cerebral involvement which would be expected to occur were these cases due to these factors. Constitutional precocious puberty is characterized not only by the development of puberal changes which were entirely normal except for the early age at which they appeared but also by the occurrence of the ovulatory menstrual cycle as evidenced by the finding of corpus luteum in 3 cases in which exploratory laparotomy was done. Hence it seems likely that many or all cases of abnormally early pregnancy that have been reported may have been instances of constitutional precocious puberty.

1. Report of the Committee on Diagnosis and Pathology, Food and Nutrition Board, National Research Council, Bulletin of the National Research Council, Number 109, November 1943.

1. Woolley, D. W., and Krampitz, L. O.: J. Exper. Med. **78**: 333 (Nov.) 1943.

2. Woods, D. D.: Brit. J. Exper. Path. **21**: 74 (April) 1940. McIlwain, H., ibid. **21**: 136 (June) 1940.

1. Novak, E.: The Constitutional Type of Female Precocious Puberty with a Report of 9 Cases, Am. J. Obst. & Gynec. **47**: 20 (Jan.) 1944.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

ARMY FACILITIES AT FORT MEADE, SOUTH DAKOTA, TRANSFERRED TO VETERANS ADMINISTRATION

The War Department announced recently that the facilities of Fort Meade, South Dakota, will be transferred to the Veterans Administration on or before April 15 for use by the agency in treating sick and wounded veterans. This will be the first of several anticipated transfers by the Army of installations which at present are not needed for training because of troop movements overseas. Decision to permit the use of such army camps by the Veterans agency was reached some time ago at a meeting between Lieut. Col. Brehon Somervell, commanding general, U. S. Army, Army Service Forces; Brig. Gen. Frank T. Hines, chief of the Veterans Administration, and Major Gen. Norman T. Kirk, Surgeon General, U. S. Army. Fort Meade, an old regular army cavalry installation, can accommodate 2,031 men. A caretaking detachment of approximately 150 personnel is stationed there at present, but all War Department personnel will be transferred on assumption of responsibility by the Veterans Administration.

APPOINT OPTICAL ADVISORY BOARD

The Office of the Surgeon General, U. S. Army, recently appointed a temporary board to be known as the Optical Advisory Board, to provide assistance in developing policies relating to the Spectacle Program and to provide for expediting decisions involving technical considerations. The board will consider such questions as may be referred to it and will meet at such times as may be requested by the officer in charge of the optical program, Lieut. Col. Walter H. Potter. Members of the board are:

Dr. William Thornwall Davis, 927 Farragut Square N.W., Washington, D. C.
Dr. Conrad Berens, 477 First Avenue, New York.
Col. Fred H. Thorne, M. C., Keesler Field, Mississippi.
Col. Burr N. Carter, M. C., Surgeon General's Office, Washington, D. C.
Lieut. Col. Walter H. Potter, Sn. C., Surgeon General's Office, Washington, D. C.

Capt. Kenneth A. Short, M. A. C., will act as liaison officer. Any questions on which board advice is desired may be submitted through Captain Short, who will report the findings or recommendations of the board.

LIEUT. HELEN E. WHARTON APPOINTED CHIEF NURSE OF FIFTH ARMY

The War Department recently announced the appointment of 1st Lieut. Helen E. Wharton, Army Nurse Corps, as chief nurse of the Fifth Army. She will be responsible for administration of nursing affairs on the scene of Fifth Army Medical Corps activities at and near the Italian front, which was formerly conducted from headquarters of the North African theater. As chief nurse, Lieutenant Wharton will be responsible for assignment of officers of the Army Nurse Corps serving with Fifth Army units in Italian combat zones and at base hospitals. She is a veteran of the Italian campaign, landing as chief nurse of an evacuation unit shortly after invasion troops secured their positions last September, and was aboard a hospital ship bombed in the bay of Salerno. Later she worked with other army nurses and doctors to restore the unit's hospital facilities and rescue patients after a tornado struck the hospital area.

Before joining the Army Nurse Corps in 1942, Lieutenant Wharton was assistant director of nursing at the New York Psychiatric Institute, New York. She is a graduate of the nursing school at Michael Reese Hospital, Chicago, with which volunteer unit she underwent training at Camp Blanding, Florida, and went overseas in April 1943.

MONTHLY MEETING OF MEDICAL OFFICERS AT ARMY MEDICAL CENTER

At the monthly meeting of medical officers in the Washington area held at the Army Medical Center, March 20, Col. J. E. Ash spoke on "Outline of the Functions and Facilities of the Army Medical Museum and Institute of Pathology," Capt. Frank H. Netter discussed "Medical Arts of the Museum, Particularly Its Application to the Training Program and to Prosthesis and Plastic Surgery," and Capt. Ralph P. Creer delivered a slide talk on "Museum and Medical Arts Service." A portfolio on first aid treatment program for enlisted men of the line and latex material used in training enlisted men of the Medical Department in emergency medical treatment was demonstrated after the meeting.

REDUCTION OF FRACTURES DURING FLUOROSCOPIC EXPOSURE

Since there are a few army hospitals which employ x-ray fluoroscopy during the reduction of fractures, the War Department has recently issued the Technical Bulletin of Medicine No. 22, in which it is recommended that, since this is one of the most dangerous uses of x-rays, lead impregnated gloves should be worn during the reduction of fractures under fluoroscopic exposure. Arrangements can easily be made with the x-ray department of any hospital for rapid film processing near the operating room, which will make possible control films to check position of fragments during reduction. These films can be processed and shown to the surgeon within two to five minutes after exposure.

BOARD ON DECLASSIFICATION OF RESEARCH AND MEDICAL REPORTS

A board of officers was recently named to consider all categories of classified technical medical and research reports and make recommendations to appropriate authority through the Surgeon General for declassification of reports when such change of classification is regarded as desirable. The board consists of the following officers:

Brig. Gen. Stanhope Bayne-Jones, chairman.
Col. Roger C. Prentiss, M. C.
Lieut. Col. William C. Menninger, M. C.
Lieut. Col. Frank R. Dieuaide, M. C.
Major Michael J. DeBakey, M. C.
Major Harold F. Dorn, Sn. C.
Major Harold M. Horack, M. C., secretary.

CAPT. CHARLES L. COGBILL JR. MISSING

Capt. Charles Lipscomb Cogbill Jr., formerly of Rochester, N. Y., has been reported missing in action in Italy since January 30. Dr. Cogbill had been serving overseas since November 1942 with the medical detachment of an infantry division. He graduated from Vanderbilt University School of Medicine, Memphis, in 1941 and entered the service in the fall of 1942.

ARMY PERSONALS

The commanding general of the Army Air Force Eighth Fighter Command announced the appointment of Major Louis Levine, formerly of Brooklyn, as commander of the base hospital at his station. Dr. Levine was commissioned as a first lieutenant in the Medical Corps July 12, 1942, and his exceptional ability earned him rapid promotion. He graduated from the University of Glasgow Medical Faculty in 1935.

Major Irving Graef, on leave of absence from the New York University College of Medicine, where he was associate professor of pathology, has been appointed director of the Medical Research Laboratory at Dugway Proving Ground, Tooele, Utah. This laboratory is an installation of the Medical Division Office of the chief of Chemical Warfare Service. Dr. Graef graduated from Cornell University Medical College, New York, in 1926 and entered the service Dec. 16, 1940.

Col. Floyd L. Wergeland, executive officer of the Medical Replacement Training Center, Camp Barkeley, Texas, since December 1942, has been named director of the Training Division, Surgeon General's Office. Dr. Wergeland succeeds the late Col. Frank B. Wakeman as director of training on the staff of Major Gen. Norman T. Kirk, Surgeon General of the Army. Dr. Wergeland is a Regular Army officer. He received his degree in medicine at the College of Medical Evangelists, Loma Linda, Calif., in 1932 and entered the service in 1933 as a first lieutenant.

Brig. Gen. Percy J. Carroll, who was recently awarded the Distinguished Service Medal (THE JOURNAL, February 26, p. 580) for his role in safely evacuating wounded from the Philippines and subsequent achievements in the Southwest Pacific and the Far East, has been appointed commander of the new 1,500 bed Vaughan General Hospital at Hines, Ill.

Col. Frank H. Dixon, who has been stationed at Second Army headquarters in Memphis, Tenn., was recently designated as Third Service Command surgeon to take charge of all medical, dental, veterinarian, nursing and sanitary activities at installations in Pennsylvania, Maryland and Virginia. Dr. Dixon graduated from Indiana University School of Medicine, Bloomington, in 1911 and entered the service in 1914.

GRADUATE MEDICAL ADMINISTRATIVE OFFICERS

The thirtieth class of the Camp Barkeley Medical Administrative Corps Officer Candidate School graduated on March 15. Brig. Gen. Roy C. Heflebower, school commandant, presented the diplomas and commissions.

NAVY

LIEUT. HARVEY F. KREUZBURG AWARDED SILVER STAR MEDAL

Lieut. Harvey F. Kreuzburg, formerly of Washington, D. C., was awarded the Silver Star Medal "for conspicuous gallantry and intrepidity as medical officer of a U. S. destroyer in action against enemy Japanese forces in the South Pacific Area on Aug. 21, 1943. Although seriously wounded in the left arm during an air attack on his ship by enemy planes, Lieutenant Kreuzburg steadfastly ministered to his injured comrades with thorough skill and efficiency until severe loss of blood forced him finally to assume the less hazardous task of directing medical aid. By his selfless devotion to duty, his professional integrity and heroic perseverance, Lieutenant Kreuzburg undoubtedly saved the lives of many men who otherwise might have perished." Dr. Kreuzburg graduated from Georgetown University School of Medicine, Washington, in 1937 and entered the service March 7, 1942.

LIEUT. FAY B. BEGOR AWARDED NAVY CROSS

Lieut. (jg) Fay B. Begor, Medical Corps, U. S. Naval Reserve, was recently awarded the Navy Cross posthumously. The citation accompanying the award read as follows: "For extraordinary heroism and devotion to duty as Medical Officer aboard an Infantry Landing Craft when that vessel was disabled by a near miss from a Japanese bomb on Sept. 4, 1943. After the crippled ship was beached at Japanese occupied Lae on the island of New Guinea, Lieutenant (junior grade) Begor calmly continued his ministrations to the wounded in the face of repeated Japanese bombing and strafing attacks until he was killed by enemy fire. His courageous spirit of self sacrifice in rendering service to others in time of extreme peril was in keeping with the highest traditions of the United States Naval Service. He gallantly gave his life for his country." Dr. Begor graduated from McGill University Faculty of Medicine, Montreal, in 1941 and entered the service Sept. 1, 1942.

LIEUT. COMDR. CLARK N. COOPER COMMENDED

Lieut. Comdr. Clark N. Cooper, formerly of Waterloo, Iowa, has been cited for "outstanding performance of duty" by Vice Admiral Frank J. Fletcher, commander of the North Pacific Force. The commendation reads "For meritorious service as senior officer of the U. S. S. *Saint Mihiel* during and subsequent to the assault on enemy held Attu Island. Lieut. Comdr. Clark N. Cooper, MC-V(S), United States Naval Reserve, was continuously on duty day and night, supervising the handling of and operating on the battle casualties received directly from the assault forces. His leadership, devotion to duty and professional skill were responsible for the excellent medical treatment received by personnel suffering from battle wounds and frozen feet. His conduct throughout was in keeping with the highest traditions of the naval service." Dr. Cooper graduated from the State University of Iowa School of Medicine, Iowa City, in 1928 and entered the service Sept. 19, 1942.

NAVY NURSE CORPS

The President recently signed H. R. 2976, the bill that gives actual rank to members of the Navy Nurse Corps during the period ending six months after the conclusion of the war. Heretofore they have had only relative rank. The enacted law places the nurses on a level with the officers of the Navy, Marine Corps and Coast Guard.

Congress recently passed an amendment to the Bolton Act which enables the Navy to participate in the education of students who are members of the United States Cadet Nurse Corps. The plan is to accept annually approximately 600 cadet nurses who are in the last half of the senior year for supervised practice in certain naval hospitals. At the end of the senior cadet practice they will be returned to their home schools for graduation. After passing their state board examinations the cadets will be eligible to make application for acceptance in the Nurse Corps of the Navy. This is a war measure only and will terminate with the last class of students to start their nursing education before the end of hostilities.

NEW NAVAL HOSPITALS TO BE CONSTRUCTED

The House Naval Affairs Committee, in a general public works authorization bill, reported recently an authorization for appropriation of $42,071,750 for the construction of new naval hospitals and additions to existing facilities, to provide 20,100 additional beds. In its report on the bill the committee pointed out that on completion of the current fiscal year 1944 a total of 60,000 naval hospital beds will be available. The committee further stated that "based on statistics compiled from actual occupancy, first eighteen months of the war, and applied to the personnel, dispersion, peakload requirements and other factors known for 1945, a total of 80,000 beds in naval hospitals will be required to meet hospitalization needs in that year."

MISCELLANEOUS

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, April 8, page 1068)

ALABAMA

Norwood Hospital, Birmingham. Capacity, 246; admissions, 5,755. Mrs. Ross E. Roberts, R.N., Superintendent (interns).

CONNECTICUT

Lawrence and Memorial Associated Hospitals, New London. Capacity, 291; admissions, 4,844. Mr. Richard J. Hancock, Administrator (interns).

IOWA

Mercy Hospital, Cedar Rapids. Capacity, 179; admissions, 3,862. Sister Mary Mercy, R.N., Superintendent (interns, residents).

MASSACHUSETTS

Wesson Memorial Hospital, Springfield. Capacity, 112; admissions, 2,898. Mr. James M. Dunlop, Superintendent (1 intern—August 1).

NEBRASKA

Lincoln General Hospital, Lincoln. Capacity, 213; admissions, 4,574. Mr. Robert B. Witham, Administrator (interns).

NEW YORK

Auburn City Hospital, Auburn. Capacity, 240; admissions, 6,844. Mr. Jerome F. Peck Jr., Acting Superintendent (assistant resident—August 1).

Meadowbrook Hospital, Hempstead. Capacity, 275; admissions, 5,085. Dr. A. J. McRae, Superintendent (2 interns—October 1).

Knickerbocker Hospital, New York City. Capacity, 200; admissions, 3,634. Mr. B. E. Foss, Administrator (5 interns).

New York City Hospital, New York City. Capacity, 880; admissions, 7,534. Dr. Beatrice Katz, Deputy and Acting Medical Superintendent (1 intern, residents—dermatology, neurology, eye, ear, nose, throat).

Highland Hospital, Rochester. Capacity, 266; admissions, 5,249. Dr. George B. Landers, Director (3 interns—September).

NORTH CAROLINA

Park View Hospital, Rocky Mount. Capacity, 125; admissions, 3,194. Mr. J. L. Melvin, Superintendent (mixed residencies).

OHIO

St. Alexis Hospital, Cleveland. Capacity, 220; admissions, 7,702. Sister Mary Elzearia, R.N., Superintendent (residents, interns).

TENNESSEE

St. Joseph Hospital, Memphis. Capacity, 316; admissions, 9,746. Sister M. Sponsaria, Superintendent (2 interns, resident).

WISCONSIN

Luther Hospital, Eau Claire. Capacity, 176; admissions, 4,377. Mr. N. E. Hanshus, Superintendent (intern, resident).

Madison General Hospital, Madison. Capacity, 234; admissions, 6,472. Miss Grace Crafts, Administrator (interns, residents—August, September, October).

STUDY CIVILIAN DISTRIBUTION OF PENICILLIN

The Chemicals Bureau of the War Production Board announced recently that, with 95 per cent of new plant construction under the penicillin program begun last June having been completed and 90 per cent of the operating facilities delivered, no further major expansions will now be approved. Only minor adjustments in approved projects necessary for the elimination of production bottlenecks will be considered at this time. However, the War Production Board stated that it may be necessary to grant a limited amount of priority assistance to individuals with original processes for making penicillin. Members of WPB's Penicillin Producers Industry Advisory Committee are now studying proposals for exchanging technical and patent information and have been asked to make recommendations on civilian distribution.

At a recent meeting of the committee, members of a subcommittee named to study the civilian distribution problem reported that any definite recommendation would be premature at this time. The supply situation is expected to become clear soon, it was said, and more time was asked to consider the problem. Chemicals Bureau officials said that the subcommittee had been asked to make recommendations on how civilian distribution should be handled when penicillin is available to the extent of some 10 billion units or more a month. Various proposals for distribution were advanced for discussion. Under one of these allocation through the National Research Council would be continued for suitable critical cases in which there is jeopardy to life for a limited number of serious but noncritical cases, and for research. Members of the industry suggested to WPB officials, however, that until such time as more than 10 billion units a month is available, rigid control of civilian distribution would be necessary to prevent black market operations and indiscriminate use of penicillin.

CASUALTIES OF U. S. ARMED FORCES SINCE OUTBREAK OF WAR

The Office of War Information reported on March 22 the number of casualties of the United States armed forces from the outbreak of the war, totaling 165,061. This total, combining the latest available War and Navy Department reports, includes 38,846 dead, 58,964 wounded, 35,521 missing and 31,730 prisoners of war. Of the prisoners of war, 1,894 have died in prison camps, mostly in Japanese occupied territory.

The War Department report (as of Feb. 29, 1944) lists army casualties totaling 123,054. Of this number 21,014 were killed, 48,260 wounded, 26,464 missing and 27,316 prisoners of war. Of the wounded 25,688 have returned to active duty or been released from the hospital. The casualties include 12,506 Philippine Scouts. Of these 469 were killed and 747 wounded. The others are assumed to be prisoners of war.

The Navy Department report (as of March 22, 1944) shows casualties whose next of kin have been notified totaling 42,007, made up of 17,832 dead, 10,704 wounded, 9,057 missing and 4,414 prisoners of war.

SUBSTANDARD DIET IN THE NETHERLANDS

In a recent release from the Netherlands Information Bureau, New York, the Dutch medical delegate to the United Nations Relief and Rehabilitation Administration conference at Atlantic City last November stated that the caloric content of the weekly ration in the Netherlands for April 1943 was 32.6 per cent below standard, animal protein 62.8 per cent, calcium 57.7 per cent, phosphorus 57.7 per cent, vitamin A 85 per cent, vitamin D 96 per cent and vitamin C 37 per cent. This means that the Dutch people are not consuming sufficient milk, bread, butter, meat, cheese, sugar, vegetables, oranges, lemons and eggs. In this connection Dr. Christian Goette, head of the Dutch-Nazi Medical Front, stated that, "in regard to the general health of the population, it must be said that resistance has been decreased as a result of the long duration of the war and that the number of infectious diseases has increased. This applies particularly to venereal diseases and tuberculosis. I wish it were possible to improve the nutrition of our youth, because undernourishment is spreading."

WINTHROP CHEMICAL COMPANY ADDS WHITE STAR TO E PENNANT

The Winthrop Chemical Company, Inc., New York, was recently awarded a white star to be added to its E flag, in recognition of continued "meritorious service on the production front." The Winthrop Chemical Company is the country's largest supplier of atabrine.

MULTIPLE VACCINES IN GERMANY

According to NPD of February 15 (Germany), German science has discovered a double vaccine, equally effective against scarlet fever and diphtheria, which is already being used in practice. Even a quadruple vaccine has been produced which renders people immune against typhoid, cholera and paratyphoid A and B bacilli.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—Public hearings have been scheduled before a subcommittee of the House Committee on Appropriations on the budget estimate for funds to continue the obstetric and pediatric program for the wives and infants of servicemen. The hearings will be held on April 27 and 28.

Bills Introduced.—H. R. 4445, introduced by Representative Bolton, Ohio, proposes to authorize temporary appointment as officers in the Army of the United States of members of the Army Nurse Corps, female persons having the necessary qualifications for appointment in such corps, female dietetic and physical therapy personnel of the Medical Department of the Army, exclusive of students and apprentices, and female persons having the necessary qualifications for appointment in such department as female dietetic or physical therapy personnel. H. R. 4519, introduced by Representative Fish, New York, proposes an appropriation of $1,000,000 to provide seeing eye dogs for certain blind veterans. H. R. 4533, introduced by Representative Tolan, California, contemplates the creation of a Chiropractic Corps in the Medical Department of the Army. H. R. 4554, introduced by Representative Davis, Tennessee, would authorize the appointment of x-ray technicians as commissioned officers in the Medical Corps of the Army and the Medical Corps of the Navy.

STATE MEDICAL LEGISLATION

New Jersey

Bills Introduced.—S. 156 and A. 295 propose to enact a separate chiropractic practice act and to create an independent board of chiropractic examiners to examine and license applicants for licenses to practice chiropractic.

Rhode Island

Bill Introduced.—S. 210 proposes to authorize the governor to appoint a special blood plasma bank commission to study the feasibility of establishing blood plasma banks in the several counties of the state for such persons as in the judgment of their attending physicians need blood plasma.

WOMAN'S AUXILIARY

New Jersey

The second meeting of the executive board of the New Jersey auxiliary for 1943-1944 was held in the executive offices of the Medical Society of New Jersey at Trenton recently. After a business session the executive board and the presidents of the county auxiliaries were served a buffet luncheon. Following the luncheon Miss Agnes Ohlson of the United States Public Health Service spoke on the Cadet Nurse Recruitment Program. Miss Wilkie Hughes, executive secretary of the New Jersey Council for War Service, spoke on the New Jersey aspects of this program.

Mrs. F. G. Wandell, chairman of Hygeia, reports that over 400 high schools and other educational institutions subscribe to *Hygeia.*

Atlantic County auxiliary held a card party for the benefit of the service men of the England General Hospital March 14 at the Madison Hotel in Atlantic City.

A health meeting sponsored by the Essex County auxiliary and the Contemporary Club of Newark was to be held March 21. Dr. Benjamin Saslow spoke on "Nutrition in Wartime."

The superintendent of the Passaic public schools spoke on "Juvenile Delinquency" at a recent meeting of the Passaic County auxiliary.

The Atlantic County auxiliary met recently at the Madison Hotel, and Miss Arreta Watts of the du Pont Company spoke on "How Chemistry Is Meeting Our Needs Today."

Essex County devoted its January meeting to a discussion of pending legislation. At the February meeting of the Hudson County auxiliary $50 was given to the Red Cross. At the January meeting of the Camden County auxiliary, held at the home of Mrs. Haines Lippincott, the members were urged to support the coming cancer drive. Rev. H. O. Wyatt, formerly a missionary to India, spoke on "Present Day India."

New York

Mrs. Leslie Sullivan, president of the New York auxiliary, was guest speaker at the annual luncheon in Albany recently. She discussed the Wagner-Murray-Dingell bill.

Albany County auxiliary has a membership of 128 women. A speakers' bureau has been formed with 7 women as speakers, and over a thousand women have had pending legislation explained to them. At the January meeting Dr. Robert Korns, epidemiologist of the New York State Health Department, spoke on "Tropical Diseases and Their Effects on Public Health." In April the auxiliary plans to collect medical supplies for the Medical and Surgical Relief Committee of America, Inc., New York City.

Nassau County auxiliary made dressings for advanced cancer patients recently; they had a Christmas party for the small patients at the Nassau hospital. Miss Yolanda Lyon of the Bureau of Public Relations of the state society spoke on methods of defeating the pending socialized medicine bill.

Texas

Mrs. A. B. Pumphrey, state president of Texas, in an article in the January issue of the *Texas State Journal of Medicine,* gives briefly the major items of interest to the auxiliary which were discussed at the meeting of the executive council of the state medical association at San Antonio recently.

OFFICIAL NOTES

DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Department of the United States Army and the United States Navy are on the air each Saturday at 4:30 p. m. Eastern war time (3:30 Central war time, 2:30 Mountain war time and 1:30 Pacific war time).

The titles and guest speakers for the next three programs are as follows:

April 15. "Decks Aflame."
Speaker, Capt. French Moore (MC), U.S.N., Washington, D. C.

April 22. "New Lease on Life."
Speaker, Col. Augustus Thorndike, M. C., U. S. Army, Washington, D. C.

April 29. "Winds That Kill."
Speaker to be announced.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Personal.—Dr. and Mrs. John Forrest McKnight, Bradley, observed their fiftieth wedding anniversary February 21.—Dr. Frances C. Rothert, Camden, has been appointed acting director of the division of maternal and child health in the state department of health, effective February 1.

State Medical Meeting in Little Rock.—The Arkansas Medical Society will hold its annual convention at the Marion Hotel, Little Rock, April 17-18, under the presidency of Dr. Samuel J. Allbright, Searcy, and with the Pulaski County Medical Society acting as host. Among the speakers will be:

Dr. Henry E. Mobley, Morrilton, Surgical Management of Hernias.
Dr. Arthur Neal Owens, New Orleans, The Applications of Fundamental Principles in the Treatment of Burns.
Dr. Ira F. Jones, Fort Smith, Caudal Anesthesia.
Dr. Donovan C. Browne, New Orleans, Cardiospasm: Its Medical Management.
Dr. Nicholas T. Hollis, Little Rock, Newer Methods of Treating the Mentally Ill.
Dr. Arthur C. Curtis, State Sanatorium, Tuberculosis Control Program in Arkansas.
Dr. Rawley M. Penick Jr., New Orleans, The Diagnosis and Treatment of Various Arterial Aneurysms.
Dr. Carl A. Rosenbaum, Little Rock, Tumor Clinic of the University of Arkansas School of Medicine.
Dr. Edgar J. Easley, Little Rock, A Brief Summary of the Modern Concepts of Acquired Syphilis.
Dr. Ludolf N. Bollmeier, Hot Springs National Park, How to Differentiate Emotional Glycosuria from Diabetes Mellitus.

CALIFORNIA

Typhoid in 1943.—There were 167 cases of typhoid reported in California last year, none of which gave substantiating evidence of having been water borne. Forty cases were traced to 14 proved carriers, 9 carriers were responsible for 1 case each and 1 carrier caused 3 cases, according to *California's Health*. Three carriers were the sources of 2 cases each. One carrier was responsible for an outbreak totaling 24 proved cases, 22 of which were recorded in 1943 and 2 in January 1944. This group of 24 cases was in Indians who attended two supper dances where the carrier served food. The second largest group of cases reported last year was in a state institution, where 7 cases were reported. There were 5 cases in one family, with 4 secondary to the first case. Eleven cases were diagnosed in California, but the patients were either ill when they arrived from other states or countries or they were taken ill within four days after their arrival. Two other patients contracted their infection while traveling through more than one county during the incubation period of the disease. It was therefore impossible to allocate these 13 cases to any single locality of California. One group of 3 cases of typhoid occurred among employees of a slaughterhouse, but the source could not be determined. There were six groups of 2 cases each, three groups of 2 cases, each due to a carrier, two groups of 2 cases, each with source undetermined, one group of 2 cases, with the second case secondary to the first. Out of the total of 167 cases recorded there were only 7 known secondary cases. There were 28 typhoid carriers recorded in California last year, 7 of whom were transfers from other states. Two carriers were reported previously as cases, but in 1943 they were determined to be carriers. Four carriers were revealed in individuals who were hospitalized for other reasons but who, on examination, were found to be carriers. Fourteen carriers were the sources of typhoid cases reported in 1943, and 1 carrier was the source of a case in 1940 which was recorded in 1943. No carriers were revealed in the course of food handlers' examinations.

CONNECTICUT

State Medical Meeting in Bridgeport.—The one hundred and fifty-second annual meeting of the Connecticut State Medical Society will be held at the Central High School, Bridgeport, May 2-4, under the presidency of Dr. George M. Smith, Pine Orchard. Among the speakers on the program will be:

Dr. Francis G. Blake, New Haven, Penicillin.
Dr. Edward A. Schumann, Philadelphia, Obstetrical Experiences.
Dr. Homer F. Swift, New York, Rheumatic Fever.
Dr. John H. Foulger, Wilmington, Del., The Principles of Preventive Medicine in Chemical Industries.
Dr. Herbert C. Miller Jr., New Haven, Erythroblastosis Fetalis: What Is It?
Dr. Thomas A. C. Rennie, New York, National Planning for Psychiatric Rehabilitation.
Dr. James M. Cunningham, Hartford, Some Comments on Psychiatric Rehabilitation.
Dr. John C. Leonard, Hartford, Some New Developments in Medicine.
Thomas J. Duffield, B.S., New York, The Value of Uniform Records.
Dr. Varaztad H. Kazanjian, Boston, Plastic Surgery Following Burns.
Captain Howard B. Sprague (MC), U. S. Naval Reserve, A Navy Doctor in the South Pacific.
Dr. Louis H. Bauer, Hempstead, N. Y., The Council on Medical Service and Public Relations of the American Medical Association.
Dr. Kalei K. Gregory, Providence, R. I., Meningococcus Infections.
Dr. Edward J. Whalen, Hartford, Chemotherapy in the Treatment of Nasal Sinus Disease.
Dr. Maynard C. Wheeler, New York, The Measurement and Treatment of Strabismus in Children.
Dr. Albert Oppenheimer, Laconia, N. H., Disease of the Spine.

A special meeting will be held Wednesday afternoon to organize a woman's auxiliary. Mrs. Eben J. Carey, Milwaukee, president of the Woman's Auxiliary of the American Medical Association, will, among others, discuss "The Purposes of the Woman's Auxiliary." The annual dinner at the Hotel Stratfield will be addressed by Governor Raymond E. Baldwin, Hartford, and Rev. Father Alphonse J. Schwitalla, dean, St. Louis University School of Medicine, St. Louis. The Connecticut Occupational Therapy Association will be addressed during the state society meeting by Mrs. Winifred C. Kahmann, OTR, Washington, D. C., on "Occupational Therapy in Army General Hospitals" and Ensign Harriet M. Jones, OTR, New York, Occupational Therapy Program in a Naval Hospital." A meeting of medical examiners will be addressed by Dr. Walter W. E. Jetter, Boston, on "Postmortem Recognition of Biochemical Disturbances." The Women's Medical Society will also convene during the session.

DISTRICT OF COLUMBIA

Personal.—Dr. James L. Hall was recently appointed superintendent of Freedmen's Hospital, succeeding Dr. John W. Lawlah, dean of the Howard University College of Medicine, who had been serving in both capacities.

Woman Dies from Rabies—Pasteur Treatment Ineffective.—The death of a woman at Gallinger Municipal Hospital, March 17, occurred five months after she had been bitten by a rabid dog. Newspapers reported that the reason the Pasteur treatment proved ineffective may have been that the woman suffered multiple bites about the head.

Army-Navy Night.—The Medical Society of the District of Columbia and its woman's auxiliary sponsored an "Army-Navy Night" on March 24. Addresses were given by Dr. Fred R. Sanderson, president, Medical Society of the District of Columbia; Vice Admiral Ross T. McIntire, Surgeon General of the U. S. Navy, and Lieut. Gen. Alexander A. Vandergrift, the commandant of the United States Marine Corps.

Clinic for Children with Cerebral Palsy.—A new consultation clinic for children suffering from cerebral palsy has been opened by the District of Columbia Society for Crippled Children at its headquarters, 1220 New Hampshire Avenue N.W., Washington. The clinic will be open one day a month and have facilities for about 25 consultations at each monthly session, the services to be free of charge. Dr. Winthrop M. Phelps, medical director of the Children's Rehabilitation Institute, Baltimore, and counselor on cerebral palsy for the National Society for Crippled Children, will supervise the clinic. According to *Medical Annals of the District of Columbia*, Dr. Phelps, formerly professor of orthopedic surgery, Yale University School of Medicine, New Haven, has established clinics in nine states and is now medical director of the state cerebral palsy program of the New Jersey Crippled Children's Commission.

KANSAS

Francisco Memorial Foundation.—A fund is being collected at the University of Kansas School of Medicine to establish the Francisco Memorial Foundation in honor of Dr. Clarence B. Francisco, Kansas City, Mo., professor of clinical surgery at the university, who died on February 23. The fund was started by medical students and faculty members, and it is hoped to accumulate sufficient funds to erect a student union building on the medical school campus in Kansas City. The building would house the medical library, a cafeteria, a recreation center, postgraduate facilities, a dormitory and rooms for visiting physicians. Dr. Francisco, who graduated at the University of Kansas School of Medicine in 1907, became associated with it in 1910.

Course on Cardiac Disorders.—A postgraduate course on cardiac disorders will be conducted April 15-23 under the auspices of the Kansas Medical Society, the University of Kansas School of Medicine and the Kansas State Board of Health.

The lectures will be given by Dr. Chauncey C. Maher, associate professor of medicine, Northwestern University Medical School, Chicago, and Dr. George A. Walker, assistant professor of pathology, University of Kansas School of Medicine. Sessions will be held in Kansas City, April 15-16; Parsons, April 17-18; Salina, April 19-20; Wichita, April 20-21, and Topeka, April 22-23. Topics to be discussed will include thyrotoxicosis and heart disease, anatomical pathology of the heart, cardiovascular renal diseases and congestive heart failure, pathologic anatomy and physiology of hypertension, electrocardiograph in clinical heart disease, heart disease in the surgical patient and heart muscle reserve.

MARYLAND

License Restored.—The license of Dr. Clift P. Berger, Washington, D. C., to practice medicine in Maryland was restored on February 2. The action was taken after Dr. Berger had received a pardon from the governor of Maryland and because of recommendations from numerous physicians who had been associaed with him.

MICHIGAN

The Hickey Lecture.—The annual Hickey Lecture of the Wayne County Medical Society was delivered at a joint session April 3 with the Detroit Roentgen Ray and Radium Society. Lieut. Col. Joseph C. Bell, M. C., A. U. S., and Major Gilbert W. Heublein, M. C., A. U. S., gave the lecture on "Diagnostic Roentgenology in an Army Hospital During the Present War."

Grant for Research in Penicillin.—A grant of more than $19,000 to the state health department laboratory for research in penicillin production methods is included in the public health bill voted during the recent special legislative session. *Michigan Public Health* believes that the state health department laboratories may be able to develop a means whereby the product can be manufactured at a cost which is practicable and is distributed on a statewide scale.

MISSOURI

State Medical Meeting in Kansas City.—The eighty-seventh annual session of the Missouri State Medical Association will be held at the Municipal Auditorium, Kansas City, April 23-25, under the presidency of Dr. Andrew W. McAlester Jr., Kansas City. Among the speakers on the program will be:

Col. John T. King, M. C., A. U. S., Heart and Hypertension.
Dr. Peter Heinbecker, St. Louis, Etiology of Hypertension.
Dr. Drew W. Luten, St. Louis, The Heart in Hypertension.
Dr. Edward Massie, St. Louis, Management of the Hypertensive Patient.
Dr. A. Morris Ginsberg, Kansas City, Psychogenic Factors in Hypertension.
Dr. Henry K. Ransom, Ann Arbor, Mich., Abdominal Incisions.
Dr. Roland S. Kieffer, St. Louis, Nutritional Problems.
Dr. William B. Kountz, St. Louis, Special Problems of Poor Surgical Risks, Especially Age.
Dr. Charles F. Sherwin, St. Louis, Selection of the Anesthetic.
Dr. Edward L. Keyes, St. Louis, Sulfonamide Drugs as an Adjunct to Surgery.

On Monday evening a banquet will be held at the Hotel Muehlebach in honor of past presidents of the association, at which the speakers will include Rev. Father Alphonse M. Schwitalla, S.J., dean, St. Louis University School of Medicine, St. Louis, who will discuss "The Position of Medical Education in Federalized Medicine." A general meeting Tuesday will be devoted to a series of panel discussions on traumatic surgery, gastroduodenal lesions, abnormal obstetrics and diabetes. A talk on the "Treatment of Leukemia with Radioactive Phosphorus" by Dr. Edward H. Reinhard, St. Louis, will conclude the meeting. The woman's auxiliary to the state association will hold its annual session at the Hotel President, April 23-24. Among the speakers will be Dr. William W. Bauer, Director, Bureau of Health Education, American Medical Association.

NEW JERSEY

The Medical Way.—The name of the official journal of the Medical Society of Cape May County is now the *Medical Way*. The name was chosen in a contest, the winners of which are James Murrin, newspaper editor of Franklin, Pa., and Dr. David B. Allman, Atlantic City, both of whom submitted the name. Both were awarded $25 war bonds.

Study of Malarial Diseases.—The board of health of Elizabeth has undertaken a study of malaria infections in the city. A part of the educational program includes the dissemination of informative material to local physicians to assist in recognizing the disease and the furnishing to them of outfits for thick and thin blood smears for the laboratory diagnosis of malaria. The Union County Mosquito Extermination Commission has again this year been granted an appropriation to be used for the prevention of anopheles breeding and to conduct research on Anopheles quadrimaculatus.

NEW YORK

Graduate Lectures.—A series of graduate lectures for the Madison County Medical Society, Oneida, opened on March 23 with a talk by Dr. A. Wilbur Duryee, New York, on "The Diagnosis and Treatment of Peripheral Vascular Disease." Others in the series include:

Richard C. Arnold, Surgeon, U. S. Public Health Service, Early Observations on the Use of Penicillin in the Treatment of Syphilis, March 30.
Dr. Edward A. Bullard, New York, The Diagnosis and Treatment of Pelvic Pain, April 6.
Dr. Albert D. Kaiser, Rochester, Rheumatic Fever—Rheumatic Heart Disease in Children, April 13.
Dr. Harry Gold, New York, Management of the Failing Heart, April 20.
Dr. Harold D. Harvey, New York, Problems of Gastric Cancer, April 27.

Cancer Teaching Day.—April 30 has been designated "Cancer Teaching Day" at Ellis Hospital, Schenectady. Among the speakers will be:

Dr. William H. Woglom, New York, Modern Trends in Cancer Research.
Dr. Arthur Purdy Stout, New York, Tumors of the Peripheral Nerves and the Adipose Tissues.
Dr. Fordyce B. St. John, New York, Carcinoma of the Stomach—Results of Studies in a Surgical Clinic. The Responsibility of the General Practitioner and the Surgeon.
Dr. Hayes Martin, New York, Tumors of the Major Salivary Glands.

The program will be presented under the auspices of the Medical Society of the County of Schenectady, the state medical society and the division of cancer control of the state department of health.

New York City

Appointments at Columbia.—The following new appointments to the staff of Columbia University College of Physicians and Surgeons have been announced:

Samuel Gelfan, Ph.D., assistant professor of physiology.
Dr. Wendell L. Hughes, associate clinical professor of ophthalmology.
Dr. Willis S. Knighton, associate clinical professor of ophthalmology.
Dr. Edgar M. Medlar, associate professor of pathology.
Dr. Maxwell D. Ryan, associate clinical professor of otolaryngology.

Alumni Day.—On April 29 "Alumni Day" will be observed at Long Island College of Medicine, Brooklyn. Speakers will include Drs. Emanuel Mendelson, on "Roentgenological Diagnosis of Intraperitoneal Fluid"; A. L. Loomis Bell, "Chronic Intermittent Intussusception," and Phillips F. Greene, "China's Attack on Disease." At the annual dinner Mr. E. E. Conroy, U. S. Federal Bureau of Investigation, will discuss "The F. B. I. in Time of War."

Dr. Beeler Named Hospital Administrator.—Dr. James Moss Beeler, formerly medical superintendent of the Grady Hospital and assistant professor of psychiatry, Emory University School of Medicine, Atlanta, Ga., has been appointed hospital administrator of the Flower and Fifth Avenue Hospitals. A graduate of the University of Louisville School of Medicine in 1917, Dr. Beeler's most recent position was director of the department of mental hygiene of the Mississippi State Hospital, Whitfield.

Gifts Honor Memory of Physician.—Mrs. John Eastman Wilson has recently given a sum of money to New York Medical College Flower and Fifth Avenue Hospitals in honor of her late husband, who at one time was professor of diseases of the nervous system at the medical school and had been associated with the college from 1902 to 1918. Dr. Eastman died Dec. 19, 1929. One gift of $100,000 has been designated as a student loan fund for needy medical students, and the other of $10,000 has been added to the department of surgery.

Dr. Erdmann Observes Eightieth Birthday.—Dr. John F. Erdmann, for many years director and professor of surgery, New York Post-Graduate Medical School and Hospital, Columbia University, observed his eightieth birthday, March 27. He was guest at a tea given in his honor by the nurses at the hospital. Dr. Erdmann retired from his teaching position at New York Post-Graduate Medical School in 1934. He is consulting surgeon on the staffs of a number of hospitals. He was born in Cincinnati on March 27, 1864 and graduated at the Bellevue Hospital Medical College in 1887.

Million Dollar Gift to United Hospital Fund.—The Jacob H. and Emma W. Schoonmaker Fund has been created under a gift of one million dollars to the United Hospital Fund of New York from a trust created in 1937 by the late Jacob H. Schoonmaker, New York. The income of the fund is to be added to the annual collection made by the fund and distributed among the eighty-seven hospitals and homes par-

ticipating. The remainder of the original trust is divided equally among the Community Service Society of New York, the New York Foundling Hospital, Fordham University and the Kingston Hospital, Kingston.

Dr. Marvin Thompson Chosen President of Warner Company.—Marvin R. Thompson, Ph.D., director of the Warner Institute for Therapeutic Research and vice president of the William R. Warner and Company, Inc., of New York and St. Louis, manufacturers of pharmaceutical products, has been chosen president of the company. Dr. Thompson once served as pharmacologist and later consultant pharmacologist to the U. S. Food and Drug Administration, associate professor of pharmacology, George Washington University School of Medicine, Washington, D. C., and professor of pharmacology and therapeutics, School of Pharmacy, University of Maryland, College Park.

Grant for Research in Industrial Medicine.—The New York Medical College has received a grant of $30,000 from the Anaconda Wire and Cable Company for research projects in industrial medicine arising out of problems incident to the manufacture of the company's products. The study will determine whether occupational hazards exist and will develop means of giving adequate protection to the workers if necessary. The project is under the direction of Dr. Lindsley F. Cocheu, director of the department of public health and industrial medicine, assisted by Dr. Linn J. Boyd, director of the department of medicine, and Dr. Francis D. Spear, director of the clinical pathology laboratories.

Master Plan for Hospitals and Related Facilities.—The planning committee of the Hospital Council of Greater New York plans to undertake this year the preparation of a master plan for hospitals and related facilities, the New York *Times* reported March 26. Dr. Haven Emerson has been named chairman of the committee to advise the council on the project, and other members include Dr. Jacob J. Golub, vice chairman; Dr. Edward M. Bernecker, commissioner of hospitals, Rev. John J. Bingham, Edward H. L. Corwin, Ph.D., David H. McAlpin Pyle and Edwin A. Salmon, all of the planning committee, and Neva R. Deardorff, Ph.D., Dr. Willis G. Nealley, Brooklyn, and Arthur W. Jones. The scope of the master plan, according to the *Times*, should show:

All existing hospitals and institutions for the care of the sick which shall have been determined to be satisfactorily located and provide adequate facilities and distribution of clinical services for the future communities to be served.

Those existing hospitals and institutions which are satisfactorily located but require certain modifications and additions.

All proposed new facilities which shall be deemed to be desirable and which, in addition to existing facilities, shall make adequate provision for a comprehensive plan of hospitals, together with recommended locations of each, with sufficient detail of each facility to provide a complete understanding of the services to be contained therein.

Such hospitals as desire to be relocated, closed or merged with other hospitals.

OKLAHOMA

State Medical Meeting in Tulsa.—The fifty-second annual session of the Oklahoma State Medical Association will be held at the Mayo Hotel, Tulsa, April 24-26, under the presidency of Dr. James Stevenson, Tulsa. Among the guest speakers will be:

Dr. Walter C. Alvarez, Rochester, Minn., Nervous Breakdowns and Their Causes.
Dr. Duff S. Allen, St. Louis, Thyrotoxicosis in Older People.
Dr. Cecil K. Drinker, Boston, An Analysis of the Modern Treatment of Severe Burns.
Dr. Harry S. Mustard, New York, Implications of Tropical and Imported Diseases from a Public Health Standpoint.

Other speakers will include:

Major Welborn W. Sanger, M. R. C., Eye Conditions Among Military Men.
Lieut. Col. Earl Rankin Denny, M. C., A. U. S., Some Observations of the Clinical Use of Penicillin.
Lieut. Col. James C. Cain, M. R. C., Peptic Ulcer and Related Conditions.
William E. Graham, P. A. Surg., U. S. Public Health Service, The Significance of Abnormal Spinal Fluid Findings in the Diagnosis and Treatment of Neurosyphilis.
Major Silas H. Starr, M. C., A. U. S., The Present Status of Pain Relief During Labor.
Major Tom Wiley Hodges, M. R. C., Lessons Learned from the Use of the Roger-Anderson Apparatus.
Major William F. Hoyt, M. C., A. U. S., Care of Chest Injuries.

At the president's inaugural dinner dance Tuesday evening Dr. Alfred W. Adson, Rochester, Minn., member of the Council on Medical Service and Public Relations, American Medical Association, will discuss "The Federal Challenge to Practitioners of Medicine." Another feature of the session will be the annual spring meeting of the Oklahoma University Medical School Association. Classes to be honored this year are those of 1914, 1924, 1934 and 1944. Special tribute will be paid to Drs. Robert M. Howard and Everett S. Lain, professors emeritus of surgery and dermatology and syphilology, respectively, University of Oklahoma School of Medicine, Oklahoma City. The woman's auxiliary to the state association will also convene.

RHODE ISLAND

"Family Physician" Honored.—The East Greenwich Lions Club and friends of Dr. Fenwick G. Taggart gathered at a reception in his honor February 28 in recognition of his forty years' service to the community. In an address as the speaker of the evening Dr. Arthur H. Ruggles, superintendent of the Butler Hospital, Providence, referred to Dr. Taggart as the "old type family physician." Dr. Taggart was presented with a silver bowl and candle sticks as a memento of the occasion. A public tribute was printed in the *Rhode Island Pendulum*, March 2, signed by George R. Hanaford, president of the town council. Dr. Taggart graduated at the University of Vermont College of Medicine, Burlington, in 1903.

SOUTH CAROLINA

Resolution Honors Work of State Health Officer.—The house of representatives on March 9 adopted a resolution commending the work of Dr. James A. Hayne, Columbia, for more than thirty-two years health officer of South Carolina.

TENNESSEE

Dr. Hardison Joins Red Cross.—Dr. Alonzo E. Hardison, director of the division of venereal disease control, Memphis and Shelby County Board of Health, recently resigned to became regional medical director for the American Red Cross, with headquarters in Atlanta, Ga.

VIRGINIA

University News.—Dr. Karl A. Menninger, Topeka, Kan., discussed "Psychiatry in Medicine" at the University of Virginia Department of Medicine, Charlottesville, recently under the auspices of the Phi Beta Pi medical fraternity. The annual Sigma Xi lecture was delivered February 9 by Kenneth C. D. Hickman, Ph.D., research chemist of the Eastman Kodak Company, Rochester, N. Y., on "Low Pressure Distillation and Vitamin Production." Dr. Theodore L. Squier, associate clinical professor of medicine, Marquette University School of Medicine, Milwaukee, addressed the Alpha Chapter of Alpha Omega Alpha, at the school, Charlottesville, February 18, on "Hematologic Manifestations of Hypersensitive States." The University of Virginia Medical Society was addressed February 28 by Dr. Everett I. Evans, Richmond, on "The Mechanisms and Management of Traumatic Shock." Dr. Samuel A. Vest Jr., Charlottesville, was elected president and Dr. Carlton J. Casey, Charlottesville, secretary.

GENERAL

Roentgenologists Plan Joint Session.—The Radiological Society of North America and the American Roentgen Ray Society will meet in joint session at the Palmer House, Chicago, September 24-29.

War Conference of Hospital Association.—The third war conference and the forty-sixth annual meeting of the American Hospital Association will be held at the Statler Hotel, Cleveland, October 2-6.

Pediatric Examinations.—The American Board of Pediatrics will hold a written examination for all applicants taking oral examinations September 22. The examination will be conducted by a monitor. Oral examinations will be held in St. Louis November 8-9 and in New York December 9-10. Additional information may be obtained from Dr. C. Anderson Aldrich, 115½ First Avenue S.W., Rochester, Minn.

Fund for Research in Allergy.—The recent establishment of a research foundation by the American College of Allergists has been announced. The foundation started with individual contributions of $50 by a certain group of fellows in the college. Voluntary donations from members are acceptable. The college also announced the first annual gift of $500 to the college from Marcelle Cosmetics, Chicago, to comprise the Marcelle Research Fund. The grant shall continue for a period of five years, and the money is to be used for such research in the field of allergy as the administrators of the fund may deem to be worthy of support.

Winners in National Traffic Safety Contest.—Utah and Aberdeen, S. D., are announced as the grand prize winners in the National Traffic Safety Contest conducted annually by the National Safety Council. All 48 states and 1,297 cities participated in the contest, which covered the calendar year 1943.

The contest rules provide that the national grand awards shall go to the state and city which, in the opinion of the judges, came nearest to doing the most that could be done practicably for traffic safety. For five years, beginning in 1939, Aberdeen has not had a single traffic fatality. It has won four first places and one second in its population group, this year winning the grand prize, which for the first time has gone to a city with less than 50,000 population.

Noise Abatement Awards.—The National Noise Abatement Council will make four awards for civic achievement in noise abatement during 1944. An award will be given to the city in each of four population groups which presents the most conclusive evidence of outstanding accomplishment in the elimination of needless street noise and the control of industrial, office and in-the-home noises during the period June 6, 1943 to May 31, 1944 and in the observance of National Noise Abatement Week, April 30 to May 6, 1944. Material submitted as supporting evidence to claims for the awards must be received by the National Noise Abatement Council, 9 Rockefeller Plaza, New York 20, not later than July 1 and may consist of any or all of the following:

Newspaper clippings of news stories, photos, cartoons, features, editorials.
Photographs of civic and special activities, window and store displays.
Scripts of radio announcements and programs, other talks and lectures.
Official statements: photostatic or other copies of proclamations and statements issued.
Posters—car cards: samples or photos with number and method of distribution.
Record of events: dates, names and places—where and when events occurred.
Statement of results: official comment, safety and traffic records, other testimonials.
Any other material or evidence of a supporting nature.

Annual Report of Rockefeller Foundation.—A total of $7,760,186 was appropriated by the Rockefeller Foundation in 1943 to cover its activities in six major fields; $2,450,000 was earmarked for public health and $1,529,000 for the medical sciences. According to the annual report of the foundation, other allocations included $599,000 for the natural sciences, $1,068,000 for the social sciences, $1,055,000 for the humanities, and $108,000 for the program in China.

The report discusses the progress made in the research in penicillin, crediting the work of Howard W. Florey, Ph.D., professor of pathology, Oxford University, and his associates for pioneering its clinical use.

In 1943 the laboratory at Lagos, West Africa, which had been opened in 1925 for the study of epidemiology of yellow fever and abandoned in 1934 because it was felt that its work could be carried on more effectively at other centers, was reopened to serve as a center for distributing yellow fever vaccine to troops and settlements in West Africa and to constitute a consultative service to the authorities in the British colonies of Gambia, Sierra Leone, the Gold Coast and Nigeria, where yellow fever has long been endemic. One of the main objectives of the new program centering in Lagos is to learn whether the jungle variety of mosquito discovered in South America has its counterpart in West Africa. If this proves to be the case, studies will be made there of the mechanism by which this form of yellow fever is transmitted to man, the work to be tied in with similar research now going forward in South America. The report states that the return to Lagos has a certain symbolic interest for the foundation, for it was in West Africa in 1927 that a blood specimen was taken from a black native named Asibi, who was sick with yellow fever. This specimen was inoculated into a rhesus monkey which had just been received from India. Asibi recovered, but the monkey died of the disease. All the vaccine manufactured since 1937, both by the Rockefeller Foundation and by government and other agencies as well, derives from the original strain of virus obtained from this humble native.

In its work on typhus the foundation, which had been concerned with the body louse as the principal carrier, sent, with the approval of the army, a typhus team to Algeria. Two extensive demonstrations there of louse control resulted in a new technic now being developed by which the insecticide is applied to individuals in a way which speeds up the process and makes possible the mass treatment of communities. The foundation is still carrying on its laboratory work on various strains of typhus in the hope of developing an effective vaccine.

In 1943, 107 men and women of Latin American countries studied on fellowships provided by the Rockefeller Foundation. Some of the appointees continued from 1942; 46 were new fellows who began their studies in 1943. A comparison of the 1943 program with that of twenty years ago, the report points out, finds public health and medicine still the dominant interests but no longer occupying the entire stage. Of the 107 fellowships active this year, 53 were in public health, 25 in medicine, 18 in the natural sciences and 11 in the humanities. Reviewing the fellowship appointments since they were created in 1917, it is found that the field of public health has claimed 328 Latin American fellows, medicine 112, the natural sciences 22, the humanities 32 and the social sciences 7—a total of 501. The fellows have come from nineteen countries, their fellowships representing a total expenditure of $1,345,842.

The report states that Dr. Bernardo A. Houssay, professor of physiology, University of Buenos Aires, who, with others, was dismissed from his post for signing a petition to the government asking for "effective democracy and American solidarity," is continuing his research in a small laboratory established for him by an Argentine foundation. The Rockefeller Foundation has made a grant for equipment and supplies and for stipends to a number of scientists who wish to work with him.

The foundation declined 920 applications for financial aid in 1943 as compared with 1,121 in 1942. Some of the applications represented projects of interest which were rejected because other opportunities seemed more promising.

According to the report, Dr. Charles N. Leach, of the Far Eastern field staff of the International Health Division, and Mr. C. G. Copley, of the foundation's Manila office, returned to America on the exchange ship *Gripsholm* in December 1943. Both had been interned since the fall of Manila. At that time the Japanese looted the foundation's office and destroyed all records. In China, Dr. Henry S. Houghton, director of the Peiping Union Medical College, and Mr. Trevor Bowen, its comptroller, are still imprisoned, and hope for their early return seems slight. The buildings of the college have been taken over by the military and the greater part of their contents removed.

CANADA

Gift to Study Industrial Diseases.—The University of Western Ontario, London, Ont., has received $100,000 from Mrs. William M. Gartshore, widow of the former president of the McClary Manufacturing Company, to "further the knowledge of disease caused by the conditions and hazards incidental to industry, so that such conditions may be improved and such hazards may be removed."

Canadian Medical Association Meeting.—The seventy-fifth annual meeting of the Canadian Medical Association will be held at the Royal York Hotel, Toronto, May 22-26, under the presidency of Dr. D. Sclater Lewis, Montreal, Que. The preliminary program mentions a series of round table conferences and section meetings on the specialties. General sessions will be addressed, among others, by Drs. Nicholson J. Eastman, Baltimore, on "The Management of Preeclampsia"; Russell B. Robson, Windsor, Ont., "Medical Care of the Industrial Worker," and Roy D. McClure, Detroit, "The Management of Breast Tumors."

FOREIGN

Deaths from Influenza Decrease Fifty Per Cent in Fortnight.—A recent report indicates that during the last week of December 1943 influenza mortality continued the decline begun earlier in the month in the large cities of England and Wales. It was stated that 464 deaths were attributed to the disease, against 1,109 and 690 during the two preceding weeks, accounting for a decline of 58 per cent in a fortnight.

Proposed Center for Treatment of Eye Diseases.—It is planned to establish at Oxford University a center for research and postgraduate study for the prevention of blindness and the better treatment of diseases of the eye. The Ophthalmological Research Endowment Committee plans to raise £250,000 for the purpose. *Science*, March 17, reports that about £26,000 toward the founding of a department of ophthalmology has been collected.

CORRECTION

Amputation with Refrigeration Anesthesia.—An abstract under this heading published in THE JOURNAL, March 18, page 808, read in part as follows: "The mortality for such amputations was formerly as high as 65 per cent. The ice and ligation method reduced this to 15.5 per cent in 45 patients who underwent 62 operations. The mortality for thigh amputations in this series was 13.3 per cent." These figures referred not to the author's series but to those of the City Hospital of New York as quoted by the author. The figures should have read "In our series the mortality was 28.5 per cent. A few years ago in the same two hospitals our mortality over a ten year period for all diabetic amputations was 75 per cent."

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 11, 1944.

The Hospitals and the National Health Service

The proposed national health service regulates every field of medical practice, including every form of institutional care —not only all general and special hospitals but also sanatoriums for tuberculosis, accommodations for the chronically sick and infirm, for rehabilitation, for infectious diseases and for mental disorders. An important problem is the planning of collaboration between voluntary and municipal hospitals. At present these are independent and have originated in different ways. The beginning of the voluntary hospitals can be traced to the houses for the leprous a thousand years ago and to the charitable movement begun by Pope Innocent III in the twelfth century and typified by the foundation in London of St. Bartholomew's Hospital in 1123. In modern times the voluntary hospitals have been founded and supported by voluntary subscriptions and donations. Thus the famous institution known as Guy's Hospital was founded by a bookseller named Guy, who endowed it with his fortune. All the British medical schools are attached to voluntary hospitals, and the advances of British medicine have mainly been the result of work performed in them.

The municipal hospitals have a different and much later origin. They originated in infirmaries for the chronically sick and infirm, established by law. Under the Local Government Act of 1929 many of these were converted into modern hospitals, with staff and apparatus which can rival the best voluntary hospitals. But they do not have the prestige of the voluntary hospitals. No medical schools are attached to them, and they have not yet had time to make medical history, though some excellent work has emanated from them. The need for cooperation between the two sets of hospitals under the unifying force of the national health service is obvious. Detailed surveys directed by the Ministry of Health are now proceeding. From these will come plans for the various areas. No voluntary hospital will be compelled to participate in the scheme for its area, but hospitals doing so will have to observe certain conditions which have been laid down. A new suggestion is that expert regional panels should be used for advice on the appointment of senior medical staffs. Hospitals agreeing to take part will receive payment for services rendered, and teaching hospitals may receive special financial assistance. But voluntary hospitals will still have to rely in part on the support of the public.

Exclusion of Women Students from Medical Schools

The right of women to enter the medical profession was won only after a long struggle, but complete equality with men has not yet been attained. In London there are twelve medical schools; one school admits only women students, two take a small proportion of women and the remaining nine have expressed inability to take women. In a letter to the *Times*, Sir Ernest Graham-Little, dermatologist and member of Parliament, points out that this denial of equal opportunities for the medical education of women conflicts with the recognized policy and tradition of London University, of which the medical schools are constituents. London is the pioneer university in admitting women to higher education, and this denial has caused grave disquiet in the university senate, of which Graham-Little is a member. In 1928 in conjunction with a well known surgeon, the late Mr. Walter Spencer, he brought forward a motion for an inquiry on the subject. A committee was appointed and decided in favor of coeducation but did not recommend any drastic change. They recognized that there were economic difficulties which had largely governed the rejection of women students by the majority of London medical schools.

The war has produced an increasing demand for women doctors, and this again brings up the subject of greater facilities for the medical education of women. Graham-Little brought it before Parliament recently, but the minister of health declared himself unable to press acceptance of women on medical schools. He pointed out that the matter would engage the attention of an interdepartmental committee on medical education which he had set up. The senate of London University appointed a highly authoritative committee to report on the desirability of providing facilities for the medical education of women. Six of the seven members of the committee recommended the opening of all London medical schools to women on terms of equality with men. By an overwhelming majority the senate approved this. The *Times* states that as a result all the nine schools which now exclude women will probably admit them. But because of the complexity of the arrangements which will have to be made, the committee's recommendation is not likely to come into full effect until some years after the war. For one thing a considerable extension of buildings will be necessary to avoid providing women's facilities at the expense of the men. This might impede the flow of new doctors, which is of great national importance.

Extension of the Roehampton Artificial Limb Center

An extension of the Roehampton Limb Fitting Center was recently opened by the Chinese ambassador, Dr. Wellington Koo, who described the hospital as a fascinating and inspiring story of successful endeavor in a practically new field of service to humanity. It had restored to the injured, through the emphasis on their status as useful members of the community, that sense of dignity and self respect without which life became a burden, he stated. The new addition would be of special interest to the United Nations, he pointed out, as it made available to them the splendid facilities of the institution for making and fitting artificial limbs. The ambassador recognized that it was a gracious gesture for Great Britain to share with the Allies the knowledge, skill and experience acquired in thirty years of limb fitting.

Penicillin Research

Since the discovery of penicillin, Lord Nuffield, the automobile magnate who is well known for his gifts to medicine, has been interested in its antibacterial properties for the cure of disease. At his suggestion the Nuffield Provincial Hospitals Trust early in 1943 undertook to make grants of $11,500 per annum for a period of five years toward the remuneration of the team of researchers working under Professor Florey at Oxford. The University of Oxford accepted these grants. This action has been taken by the trust with the concurrence of the Medical Research Council, which has been supporting the work for several years and is continuing to make a substantial grant for research expenses. Subsequently the trust also agreed to make substantial grants to enable the penicillin treatment of meningitis, abscess of the brain and other pyogenic diseases.

The Royal Commission on Population

The names of the members of the Royal Commission on Population and of its technical committees on the statistical, economic and biologic aspects of the population problem have recently been published. The statistical committee comprises well known writers such as A. M. Carr Saunders, D. V. Glass and R. R. Kuczynski. The last named member is distinguished for the introduction of "Kuczynski's unit," which isolates the factor on which the trend of population depends; it is called the "net reproduction rate." This expresses the number of

women in the next generation who will replace the women of reproductive age of this generation, if birth and death rates remain the same. If the net reproduction rate is unity, the population is exactly reproducing itself; if it is less, the population must diminish. Our reproductive rate in 1933 has been calculated at 0.734, less than three fourths of the rate necessary to sustain the present population.

BUENOS AIRES

(From Our Regular Correspondent)

March 4, 1944.

Endocrine Therapy in Cancer of the Breast

Dr. Erico Fels of Buenos Aires administered testosterone propionate to 3 patients with cancer of the breast. In none of the cases was the cancer cured. However, all the patients greatly improved. The degree of improvement depended on how soon in the course of the disease the treatment was administered. One patient had a uterine fibroma which disappeared in the course of the therapy. The second patient resorted to the therapy late in course of the disease. The improvement was moderate. The third patient had a cancer in the form of a cuirass. She is still under treatment. The progress of the big ulcer stopped after treatment was undertaken; the amount of fetid secretion diminished. In the microscopic preparations of the first case, after administration of testosterone propionate, a great proliferation of fibrous tissue was encountered, which was abundant in comparison to that observed in the biopsy taken before administration of the therapy. The fibrous tissue surrounded the focus of cancer. The tumor cells did not show any injury. Fels believes that testosterone propionate stimulates an acute proliferation of fibrous tissue which blocks the tumor cells and prevents their progress to the neighboring tissues. A direct effect on the substance of the tumor itself has not been proved as yet. The author advises further observations to verify the good results of this treatment.

Microflora of Meconium

Drs. Carlos P. Montagna and Maria S. Cataldi of the National Institute of Nutrition have reported their observations of 44 samples of meconium. The newborn infants were normal. Thirty-five were born in normal delivery, whereas 9 were delivered by cesarean section. The age varied from 5 minutes to 96 hours. Bacteria were present in all the samples of meconium; the amount increased with the age of the infant. The meconium contained enterococci in 93 per cent of the cases, colibacilli in 63 per cent, lipolytic bacteria in 50 per cent, bacteria which slowly fermented lactose in 47 per cent, proteolytic bacteria in 34 per cent, sporulated and nonsporulated anerobia in 34 and 11 per cent respectively, fungi in 18 per cent and yeasts in 9 per cent of the cases. Lactobacillus bifidus was found in the meconium of 45 newborn infants. It was encountered twenty-four hours after birth in the group of normal deliveries and after forty-eight hours in the group of infants from cesarean sections. It was encountered in all cases before the infant received food. The authors concluded that the microscopic flora of the meconium is the same in groups of infants from normal deliveries and from cesarean section.

Public Health in Chile

The services of public health in Chile are distributed through three channels: the Department of Social Aid and Beneficence, the National Department of Public Hygiene and Sanitation and the Department of Social Work. The Department of Beneficence provides medical care, drugs and social aid to the poor. It supports and controls the national asylums and hospitals. The National Department of Public Health and Sanitation is concerned with the sanitation of the country, the prevention and control of epidemics and contagious disease, the organization and maintenance of national sanitary personnel and the care of international health. It is concerned with various aspects of the protection of the individual, the family, the mother and her child. The centers of social insurance provide protection for the health of workers, civil employees of the state and members of the various armed forces up to a total number of 1,500,000.

One of the most important social insurance organizations is the Caja de Seguro Obligatorio de Enfermedad e Invalidez, which was founded in 1825. This organization provides insured workers and their wives and children up to the age of 2 years with medical care and medicines for therapeutic and preventive purposes. The organization also provides maternity care to the workers' wives, pensions to the family during illness of the wage earner and periods of rest to patients and nursing mothers. The monthly pension is equivalent to the whole monthly salary of the insured. Disability of the insured is compensated with a life pension. A retirement pension becomes effective at ages varying from 55 to 65 according to the age at which the insurance started. From 1925 to 1931 the insured was permitted to choose his physician. Later on, consulting offices were established in various zones of the country. The insured receive proper attention in the consulting offices, which are staffed by groups of appointed physicians. The consulting offices have equipment and facilities for giving general and specialized care and medicines to the insured. The organization also has its own pharmacies and dental and other laboratories. A movement to extend the benefits of social insurance to people living in rural areas was started recently.

Puerperal Inversion of Uterus

Dr. Victorio Monteverde, professor of gynecology of the Faculty of Medicine of the University of La Plata and dean of the faculty and head of the Center of Maternity and Social Assistance of the Hospital Piñero of Buenos Aires, with the collaboration of Dr. Diego Taylor Gorostiago recently published an article on the case of a multiparous woman with complete inversion of the uterus due to traction of the retained membranes after delivery. There was no shock. The inverted structure was introduced in the vagina. An operation was performed two days later. It consisted in exteriorization of the uterus, opening of the posterior aspect of the uterus, beginning at the neck and following it in an extension of 5 centimeters, and reinversion of the uterus. Because of the friability of the uterus, the lips of the surgical wound were only put in contact and peritonized, without suturing. The structure was powdered with azosulfamide and replaced after suturing of a 3 centimeter laceration on the anterior aspect, which occurred during the operation. A drainage tube was left in the Douglas cul-de-sac for forty-eight hours. A transfusion of total blood was administered. The postoperative period was normal. A small embolism occurred nine days later, after which the patient recovered fully.

Marriages

JERMAN WALTER ROSE JR., Henderson, N. C., to DR. GRACE MARIE COMARATTA of Harrisburg, Pa., in Pensacola, Fla., February 9.

NORMAN R. GOLDSMITH, Bethesda, Md., to Miss Emphia Fisher of North Judson, Ind., in Washington, D. C., March 24.

JOHN K. CHORLOG, Madison, Wis., to Mrs. Lydia F. McIntyre of Grand Forks, N. D., in Minneapolis, February 14.

STANLEY C. CLADER, Washington, D. C., to Miss Sue Ross Welch in New Orleans, March 11.

ORREN BOND LANDRUM to DR. LYDIA VIOLA WATSON, both of Dyersburg, Tenn., March 18.

JOHN M. CAMERON, Faunsdale, Ala., to Miss Harriet Connor of Peoria, Ill., March 11.

CARLE H. HOLMSTROM to Miss Estelle Filipi, both of Warren, Minn., March 16.

Deaths

Warren Taylor Vaughan ✠ Richmond, Va., authority on allergy, died at his home, April 2, aged 51.

Dr. Vaughan was born in Ann Arbor, Mich., Feb. 22, 1893. He entered the University of Michigan Medical School, where he graduated in 1916. He served his internship at the Peter Bent Brigham Hospital, Boston. He was in the medical corps of the U. S. Army from 1917 to 1919, concluding his service with the rank of lieutenant colonel. While overseas he was chief of medical service at Camp Hospital 41, American Expeditionary Forces, Is-sur-tille, France. In 1920, ending a year as assistant in preventive medicine and hygiene at Harvard Medical School, Boston, Dr. Vaughan began the practice of medicine in Richmond, specializing in allergy. With Dr. W. Randolph Graham he founded the Vaughan-Graham clinic, known for its work in allergy diseases. It was in Richmond that Dr. Vaughan was instrumental in alleviating the allergy which affected Adm. William F. Halsey. A rash had incapacitated Admiral Halsey but Dr. Vaughan's treatment prepared him for his command in the Solomons in November, where he won a decisive victory against the Japanese.

Dr. Vaughan was the son of the late Dr. Victor C. Vaughan, once President of the American Medical Association and for many years closely allied with the association's activities. The late Dr. Victor C. Vaughan Jr. was his brother. Dr. J. Walter Vaughan, Richmond and Henry F. Vaughan, Dr.P.H., Ann Arbor, are also brothers. He leaves four sons, Warren T. Jr., Boston, and Victor C. 3d, New Haven, Conn., both of whom are physicians, and John H. and David Vaughan, students at Harvard Medical School.

Dr. Vaughan was a member of numerous organizations, including the Southern Medical Association, American Society of Clinical Pathologists, American Rheumatism Association, Society for Investigative Dermatology, International Society of Gastroenterology and the Virginia Academy of Science. He was an honorary member of the Institute of the Practice of Medicine, Barcelona, Spain, and the Society for the Study of Allergy, Argentina. He had been past president, vice president and secretary-treasurer of the American Association for the Study of Allergy and president of the Society for the Study of Asthma and Allied Conditions, and vice president of the Medical Society of Virginia, 1931-1932. He was a member of the committee on aerobiology of the National Research Council, director of the Research Council on Problems of Alcohol, and a fellow of the American Association for the Advancement of Science, serving since 1938 as a member of its council. He served on the advisory committee to the Committee on the Costs of Medical Care.

Certified as a specialist by the American Board of Internal Medicine, Dr. Vaughan's chief interest centered in the field of allergy. In addition to numerous articles on the subject, he was the author of "Influenza, an Epidemiologic Study," 1921; "Allergy and Applied Immunology," 1931 and 1934; "Practice of Allergy," 1939 and 1943; "Primer of Allergy," 1939, and "Strange Malady," 1941. He was editor of the *Journal of Laboratory and Clinical Medicine*, a position first held by his father, associate editor of the *Journal of Allergy*, member of the editorial board of the *American Journal of Digestive Diseases* and the *American Journal of Clinical Pathology*, and collaborating editor of *Folia clinica chimica et microscopica* (Bologna, Italy). He was once a member of the editorial board of the *Review of Gastroenterology* and of the *American Journal of Syphilis, Gonorrhea and Venereal Diseases*.

In 1941 the University of Michigan Medical School, Ann Arbor, where his father had served as dean for many years, awarded Dr. Vaughan the honorary degree of master of science for his "contributions to internal medicine and more particularly his notable studies in allergy."

Oswald Evans Denney ✠ Senior Surgeon, U. S. Public Health Service, Galveston, Texas; University of Pennsylvania Department of Medicine, Philadelphia, 1913; resident physician at Philippine General Hospital, 1913-1914, and San Lazaro Hospital, Manila, 1914-1915; resident physician and later chief, Culion Leper Colony, Philippine Islands, from 1915 to 1919; executive officer of the fourth district, U. S. Public Health Service, 1919-1920; medical officer in charge of the National Leprosarium, Carville, La., from 1921 to 1935; chief quarantine officer of the Panama Canal Zone from 1936 to 1939; traveling representative for the Pan American Sanitary Bureau in 1940; fellow of the American College of Physicians; member of the American Society of Tropical Medicine, Association of Military Surgeons of the United States and the International Leprosy Association; since 1940 medical officer in charge of the U. S. Marine Hospital and chief quarantine officer in Galveston; died February 19, aged 58, of pulmonary fibrosis due to old pulmonary disease.

Walter Bernard Coffey, San Francisco, died March 25, aged 75. He graduated from the Cooper Medical College, San Francisco, 1889. He was a member of the California Medical Association and at one time councilor of the Sixth District; also a fellow of the American College of Surgeons. Dr. Coffey was awarded the degree of doctor of laws from St. Mary's College, Oakland. He was a member of the staff and formerly president of St. Francis Hospital and served as chief surgeon of the Dollar Steamship Company and for many years as surgeon for the Southern Pacific Railroad and chief surgeon and general manager of the Southern Pacific Hospital. He was also said to be the first director of the Municipal Health Service System. In these positions he developed great influence and was for many years an important leader of medicine in California. In recent years his name had been associated with the promotion of the Coffey-Humber technic for treating cancer.

Curtis Campbell Mechling ✠ Pittsburgh; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1903; specialist certified by the American Board of Surgery; member and past president of the American Proctologic Society; fellow of the American College of Surgeons; served as a captain in the medical corps of the U. S. Army during World War I; professor of proctology at the University of Pittsburgh School of Medicine and head of department of proctology at Falk Clinic; a member of the consulting staffs at Magee and Homestead (Pa.) hospitals; proctologist at Pittsburgh Diagnostic and Pittsburgh Skin and Cancer Clinics; senior staff proctologist at St. Francis Hospital and the Presbyterian Hospital, where he died March 1, aged 69, of heart disease.

Samuel Broders Moore, Alexandria, Va.; Georgetown University School of Medicine, Washington, D. C., 1897; member and formerly vice president of the Medical Society of Virginia; past president of the Alexandria City Medical Society and the Northern Virginia, District of Columbia and Maryland Medical Society; fellow of the American College of Surgeons; for many years surgeon for the Southern Railway System, Chesapeake and Ohio Railroad and the Richmond, Fredericksburg and Potomac Railroad as well as the Fruit Growers Express; served as chief surgeon, Alexandria Hospital; died March 15, aged 71, of coronary thrombosis with pulmonary edema.

Ernest Southerland Bulluck ✠ Wilmington, N. C.; University of Maryland School of Medicine, Baltimore, 1911; past president of the New Hanover County Medical Society; formerly vice president of the Medical Society of the State of North Carolina; fellow of the American College of Surgeons; served in the medical corps of the U. S. Army during World War I; surgeon, Community Hospital; on the courtesy staff, James Walker Memorial Hospital; consulting surgeon, Wilmington Red Cross Sanatorium; founder and medical director, Bulluck Hospital, where he died March 13, aged 55, of coronary thrombosis.

Henry Robert Gledhill ✠ Jerseyville, Ill.; College of Physicians and Surgeons, New York, 1894; past president of the Jersey County Medical Society; recently a member of the examining board of the Jersey County Selective Service; secretary of the county draft board during World War I; for many years a member of the board of education, serving two terms as president of the Jersey township high school; served on the board of directors of the Jerseyville Public Library and as a member of the George Washington Educational Fund; died February 12, aged 75, of cerebral hemorrhage.

William Parr Davidson ✠ Decatur, Ill.; Louisville (Ky.) Medical College, 1897; past president of the Moultrie County Medical Society; first lieutenant in the medical officers reserve corps during World War I; chief surgeon, Illinois Masonic Home, Sullivan, from 1903 to 1914; local surgeon for the Illinois Central Railroad from 1910 to 1925 and the Chicago and Eastern Illinois Railroad from 1915 to 1923; on the staffs of the Decatur and Macon County Hospital and St. Mary's Hospital, where he died February 10, aged 72, of pulmonary edema, myocardial failure and coronary occlusion.

Marie K. Formad, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1886; formerly clinical professor of gynecology at her alma mater; served with the women's overseas unit for fourteen months in France during World War I and was decorated by the French government; in 1936 the Marie K. Formad Endowment Fund was established at the Woman's Hospital, where she had been chief of the gynecologic staff and later a member of the consulting staff; died in the Friends Hospital February 21, aged 83, of coronary artery disease and arteriosclerosis.

Edgar Gordon Cuddeback ✠ Port Jervis, N. Y.; Cornell University Medical College, New York, 1906; examining physician for the draft board; vice president and a director of the National Bank and Trust Company of Port Jervis, a director of the Port Jervis Savings and Loan Association and of the Port Jervis Hotel Corporation; a member of the executive committee of the Minisink Valley Historical Society; for many years surgeon for the Erie Railroad; on the staff of St. Francis Hospital, where he died February 10, aged 61, of congestive heart disease.

George W. Larendon, Kerrville, Texas; Jefferson Medical College of Philadelphia, 1889; member of the State Medical Association of Texas; formerly a major in the medical corps of the Texas National Guard; served during World War I; lieutenant colonel in the medical reserve corps of the U. S. Army, not on active duty; at one time health officer of the city of Houston and Harris County; served as deputy state health officer; formerly on the staffs of St. Joseph's Infirmary and the Memorial Hospital; died in Houston February 18, aged 75, of uremia.

Frank Clemm Adams ✠ Yellow Springs, Ohio; Cincinnati College of Medicine and Surgery, 1901; past president of the Greene County Medical Society; died in the McClellan Hospital, Xenia, February 12, aged 79, of arteriosclerotic heart disease and diabetes mellitus.

William Pitt Baldwin ✠ New Haven, Conn.; Yale University School of Medicine, New Haven, 1890; New York Homeopathic Medical College and Hospital, New York, 1891; fellow of the American College of Surgeons; at one time a member of the board of councilmen, an alderman, representing the first ward, and a member of the city park commission; consultant, Charlotte Hungerford Hospital, Torrington; consultant in surgery, Grace Hospital, where he died February 5, aged 76, of pneumonia.

Willard Asa Bates ✠ Littleton, N. H.; Dartmouth Medical School, Hanover, 1901; served in the medical corps of the U. S. Army during World War I; on the staff of the Littleton Hospital; president of the Lions Club; died suddenly February 8, aged 66, of cerebral hemorrhage.

Gerrit Judd Bennett, Waterloo, Iowa; Kansas City (Mo.) Medical College, 1895; died February 6, aged 84, of a self-inflicted bullet wound.

Elbert Amsden Bing, Marshall, Ark.; St. Louis University School of Medicine, 1906; member of the Arkansas Medical Society; past president of the Searcy County Medical Society and the Ninth Councilor District Medical Society; died February 2, aged 67, of heart disease.

Frank Wheeler Braden ✠ Washington, D. C.; Georgetown University School of Medicine, Washington, 1895; for many years examining physician and surgeon for the Standard Oil Company and police surgeon for the District of Columbia; served as examiner for the Panama Canal Commission; died February 19, aged 72, of ruptured aortic aneurysm.

Cerilda Niswonger Bromley, East St. Louis, Ill.; Woman's Medical College, Chicago, 1891; died February 4, aged 78, of acute dilatation of the heart, arteriosclerosis and chronic myocarditis.

Joseph Cecire, Newark, N. J.; Long Island College Hospital, Brooklyn, 1909; died February 3, aged 67, of coronary occlusion, hypertension and arteriosclerosis.

Cono Ciufia ✠ Chicago; Northwestern University Medical School, Chicago, 1927; formerly a Methodist minister; for many years clinical assistant in surgery at his alma mater; served as senior physician on the staff of the Cook County Infirmary, Oak Forest, Ill.; on the staffs of the Walther Memorial and Grant hospitals; member of the chamber of commerce of Park Ridge, Ill.; died suddenly February 11, aged 50, of cerebral hemorrhage.

Celia O. Clemans, Dover, Ohio; Homeopathic Hospital College, Cleveland, 1893; died in the Elyria Memorial Hospital, Elyria, February 13, aged 83, of generalized arteriosclerosis and hypertension.

Benjamin Myron Cohen, Cambridge, Mass.; Tufts College Medical School, Boston, 1927; died suddenly February 9, aged 41, of acute dilatation of the heart.

Hugh Francis Crawford ✠ Memphis, Tenn.; Memphis Hospital Medical College, 1903; assistant professor of medicine at the University of Tennessee College of Medicine; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; member of the National Gastroenterological Association; served as attending physician, John Gaston, Baptist Memorial and Methodist hospitals; on the editorial board of the *Review of Gastroenterology;* died February 18, aged 61, of tuberculosis.

Edward Joseph Cronin, Boston; Tufts College Medical School, Boston, 1921; head of draft board number 37, Allston, Mass.; junior chief of medical staff and secretary of staff, St. Elizabeth's Hospital; died in the Cardinal O'Connell House of the hospital February 11, aged 46, of acute disseminated tuberculosis.

Volney Nevin Fackler ✠ Richmond, Ind.; State College of Physicians and Surgeons, Indianapolis, 1907; died February 1, aged 71, of coronary occlusion.

Leslie Freudenthal ✠ Gridley, Calif.; University of California Medical School, San Francisco, 1926; served during World War I; member of the Gridley Rotary Club; died in an Oroville hospital March 1, aged 44, of injuries received in an automobile accident.

Realious Farrow Goolsby, Chicago; Meharry Medical College, Nashville, Tenn., 1913; on the staff of the Provident Hospital; died February 3, aged 59, of carcinoma of the brain.

Solomon Greenbaum, Newark, N. J.; Bellevue Hospital Medical College, New York, 1889; for many years on the staff of the Beth Israel Hospital; died February 24, aged 85, of arteriosclerosis.

Delbert Davis Hamlin ✠ Marlboro, Ohio; University of Louisville (Ky.) School of Medicine, 1932; on the staffs of the City Hospital, Alliance, and the Mercy Hospital, Canton; died February 17, aged 39, of cardiac occlusion.

Joseph Augustus C. Hartman ✠ Eggertsville, N. Y.; University of Buffalo School of Medicine, 1920; died in the Millard Fillmore Hospital, Buffalo, recently, aged 46, of multiple neuritis and bulbar paralysis.

Jacob Abraham Hartmann ✠ St. Louis; Washington University School of Medicine, St. Louis, 1896; served as autopsy physician to coroner city of St. Louis; served during World War I; died in St. Luke's Hospital February 3, aged 74, of common duct stones and perforation of bowel.

Frank T. Harvey, Milford, Mass.; New York Homeopathic Medical College and Hospital, New York, 1893; formerly physician in charge of the Harvey Hospital; honorary member of the staff of the Milford Hospital; died in the Worcester Hahnemann Hospital, Worcester, February 1, aged 77, of coronary thrombosis and pneumonia.

Charles Higby Hoffhine ✠ Columbus, Ohio; Starling Medical College, Columbus, 1905; at one time instructor in ophthalmology at the Ohio State University College of Medicine; on the staff of the Grant Hospital, where he died February 8, aged 60, of heart disease.

Walter Chester Kite ✠ Milton, Mass.; University of Pennsylvania Department of Medicine, Philadelphia, 1893; member of the New England Pediatric Society; served on the local board of health; for many years on the staffs of the Milton Hospital and Convalescent Home and the Boston Home for Incurables; died February 5, aged 79, of coronary thrombosis.

Louis Landman ✠ New York; New York Homeopathic Medical College and Flower Hospital, New York, 1918; clinical assistant, department of surgery, New York Medical College, Flower and Fifth Avenue Hospitals; member of the staffs of the Misericordia and Metropolitan hospitals; died February 7, aged 54, of malignant hypertension.

Joseph Verner Leech ✠ Pittsburgh; University of Pittsburgh School of Medicine, 1928; on the staff of the Columbia Hospital, Wilkinsburg, where he died February 9, aged 47, of Hodgkin's disease.

John D. Lindsay, Spring City, Tenn.; Chattanooga Medical College, 1901; died in the Chamberlain Memorial Hospital, Rockwood, January 18, aged 67, of heart disease and pneumonia.

Cornelius D. Mackey, Chicago; University of Buffalo School of Medicine, 1889; member of the Illinois State Medical Society; died February 27, aged 83, of chronic myocarditis.

John Galbraith Mackey ✠ San Fernando, Calif.; University of Southern California College of Medicine, Los Angeles, 1898; founder and owner of the San Fernando Hospital, where he died February 11, aged 72, of cerebral hemorrhage.

Charles Mackin MacNelly ✠ Weatherford, Texas; University of Nashville (Tenn.) Medical Department, 1898; past president of the Palo Pinto-Parker Counties Medical Society; died February 5, aged 69, of coronary occlusion.

Charles Benton Marshall, Nitro, W. Va.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1920; member of the West Virginia State Medical Association; formerly an assistant surgeon in the U. S. Public Health Service reserve; died in the University Hospital, Baltimore, February 5, aged 49, of cerebral hemorrhage.

Henry Allen May ✠ Washington, Mo.; Beaumont Hospital Medical College, St. Louis, 1894; formerly secretary of the Franklin County Medical Society; on the staff of St. Francis Hospital; physician for the Missouri Pacific Railroad; died January 31, aged 71, of chronic myocarditis.

James A. McCollam, Uhrichsville, Ohio; Starling Medical College, Columbus, 1890; member of the Ohio State Medical Association; past president and secretary of the Tuscarawas County Medical Society; served as the first health commissioner of Uhrichsville and for three terms as president of the board of trade; founder and formerly head of the Uhrichsville high school library association; member of the chamber of commerce; died March 13, aged 75, of acute coronary occlusion.

Wyatt Young McDaniel ✠ Taylors, S. C. Chattanooga (Tenn.) Medical College, 1900; died January 21, aged 70, of arteriosclerosis and cerebral hemorrhage.

Guy Tingley Meek, Bexley, Ohio; Starling Medical College, Columbus, 1896; member of the Ohio State Medical Association; served as a captain in the medical corps of the U. S. Army during World War I; from 1919 to 1932 medical examiner for the U. S. Veterans Administration; on the staff of St. Francis Hospital, Columbus; died January 24, aged 69, of carcinoma of the right side of the kidney and liver.

D. Wesley Moore, Jellico, Tenn.; University of Louisville (Ky.) Medical Department, 1887; member of the Tennessee State Medical Association; formerly mayor of Jellico; died January 22, aged 83, of pneumonia.

John Thomas Moser, Caneyville, Ky.; Hospital College of Medicine, Louisville, 1907; died January 27, aged 68, of pneumonia.

Charles Light Mulherin, Newbern, Tenn.; Vanderbilt University School of Medicine, Nashville, 1910; died in the U. S. Public Health Service Hospital, Lexington, Ky., January 23, aged 57, of carcinoma of the digestive tract.

Roscoe Damon Perley ✠ Melrose, Mass.; Harvard Medical School, Boston, 1896; for many years on the staff of the Melrose Hospital; formerly on the staffs of the Massachusetts General and Boston Lying-in hospitals, Boston; died January 21, aged 80, of heart disease.

CAPT. WALTER S. CALDWELL
M. C., A. U. S., 1905-1943

LIEUT. DELBERT B. MALLAMS
(MC), U.S.N.R., 1915-1944

Urban Joseph Whitehead Peters ✠ Birmingham, Ala.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; member of the Rotary Club; on the staff of St. Vincent's Hospital, where he died January 26, aged 74, of myocardial failure.

John Lyte Ressler, Bird In Hand, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1899; member of the Medical Society of the State of Pennsylvania; served as deputy coroner for many years; at one time medical director of the Lancaster County Hospital and Hospital for Insane, Lancaster; died January 21, aged 74, of diabetes mellitus.

George Anthony Retel, Buffalo; University of Buffalo School of Medicine, 1893; member of the Medical Society of the State of New York; at one time school physician; died in the Deaconess Hospital January 21, aged 75, of pneumonia.

Felix Rose, Green Bay, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; physician at the Odd Fellows Home; died January 15, aged 66, of acute appendicitis and complications.

Myra Daniel Allen Ruppel, Pasadena, Calif.; Woman's Medical College of Pennsylvania, Philadelphia, 1887; for many years a member of the school committee in Lynn, Mass.; died in January, aged 81.

Purnell Fletcher Sappington, Perry Point, Md.; University of Maryland School of Medicine, Baltimore, 1887; member of the Medical and Chirurgical Faculty of Maryland; also a pharmacist; served during World War I; for many years chairman of the Bel Air town board; died in the Veterans Administration Facility January 23, aged 79, of coronary disease and arteriosclerosis.

Franklin Taylor Scanlon ✠ Morgantown, W. Va.; University of Nashville (Tenn.) Medical Department, 1910; past president of the Monongalia County Medical Society and vice president of the West Virginia State Medical Association; captain in the medical corps of the U. S. Army during World War I; a director of the First National Bank and a member of the Kiwanis Club; on the staffs of the Heiskell Memorial Hospital and the Monongalia General Hospital, where he died February 25, aged 65, of mesenteric thrombosis.

Bert A. Smith, Auburn, Neb.; Chicago College of Medicine and Surgery, 1913; member of the Nebraska State Medical Association; on the staff of the Auburn Hospital; died January 11, aged 55, of coronary thrombosis.

Okey Warren Snodgrass, Frankford, Mo.; Barnes Medical College, St. Louis, 1910; died in St. Elizabeth's Hospital, Hannibal, January 28, aged 68, of heart disease.

Howard Somers, Morgan Hill, Calif.; Cooper Medical College, San Francisco, 1904; member of the California Medical Association; died in the Wheeler Hospital, Gilroy, January 20, aged 63, of heart disease.

John Wilson Stevenson, Hoquiam, Wash.; Drake University College of Medicine, Des Moines, 1907; member of the Washington State Medical Association; formerly county coroner and city health officer; died in Aberdeen January 20, aged 79, of cerebral hemorrhage.

Joseph Milton Trigg ✠ St. Louis; College of Physicians and Surgeons, Keokuk, Iowa, 1893; at one time professor of clinical surgery and surgical pathology at the St. Louis College of Physicians and Surgeons; on the surgical staff of the Missouri Baptist Hospital, where he died January 27, aged 73, of pneumonia.

KILLED IN ACTION

Walter Spohn Caldwell ✠ Kilgore, Texas; University of Texas School of Medicine, Galveston, 1931; formerly a member of the Kilgore Junior Chamber of Commerce and Lions Club; began extended active duty as a captain in the medical corps, Army of the United States, on Aug. 25, 1942; attached to an antiaircraft battalion; killed in action in the North African area, Nov. 20, 1943, aged 38.

Delbert Bevan Mallams, Ashland, Pa.; Temple University School of Medicine, Philadelphia, 1941; served internship at the Robert Packer Hospital, Sayre; commissioned a lieutenant (jg), medical corps, U. S. Naval Reserve, on July 14, 1942; began extended active duty Sept. 7, 1942 with the amphibious force, Paradise Creek Dispensary, Norfolk Navy Yard, Portsmouth, Va.; medical and surgical officer in charge of a flotilla of 18 LCI boats; participated in the invasions of Pantelleria, Sicily, Salerno, Nettuna and the battle of Anzio; recipient of five stars, European medal, Presidential Citation and the Purple Heart; promoted to lieutenant; drowned at sea while in naval action off the Anzio beachhead, January 26, aged 28.

Bureau of Investigation

DAVID B. CROPP CROPS UP AGAIN

Post Office Department Detects Old Fraud Under New Name

For many years David B. Cropp of New York has been in and out of a fraudulent "height increasing" scheme perpetrated through the mails. It began apparently with "The Pandiculator," one of the earliest of the alleged spine-stretching devices. This one was advertised in pulp periodicals at least as far back as 1914.

Whether Cropp was its originator is not clear. In 1918 he sold the business to one Henry C. Crowell, a Cleveland attorney, according to the latter's testimony in 1941, when his concern, known as the Pandiculator Company, was debarred from the mails by the Post Office Department as a fraud. Some time after buying the thing from Cropp, Crowell, according to his testimony, sold it to a Harry L. Spaulding, from whom he bought it back in 1932 and operated it until 1941, when the aforementioned fraud order was issued against the names The Pandiculator Company and H. C. Crowell.

In April 1942 an additional fraud order was issued against H. C. Crowell alone, after the Post Office discovered that he had simply remained in the business and run it under his own name instead of that of the Pandiculator Company. Meantime, it appears, Cropp had reentered the business or started a competing one, operating under the trade style "International Health Device Corporation" and calling his product "The Therapeutic

PANDICULATE FOR HEALTH
BE WELL
YOUNG
STRONG
Booklet Free
Fifteen glorious minutes on Pandiculator better than two hours in gymnasium. Refreshes, rejuvenates. Helps retain youth, energy, vigor, vim. Wonderful results. Doctors recommend it. No electricity, no discomfort; delightfully restful. Write for Free Booklet.
PANDICULATOR CO., 651 Hanna Bldg., Cleveland, Ohio

A typical "Pandiculator" advertisement.

Couch" or "The Cropp Therapeutic Couch." The description of it seems to correspond to that of the Pandiculator. Reportedly Cropp used testimonials from laymen, osteopaths, chiropractors and physiotherapists as to the efficacy of the couch in treating many serious disorders, besides increasing height and reducing weight and waistline measurements. This enterprise also came to grief when a Post Office fraud order was issued in October 1942 against the names David Cropp, David B. Cropp and the International Health Devise Corporation.

But Cropp apparently decided not to let a mere government ukase interfere with his profits. He hit on a new trade style, "Physical Improvement, Inc.," but retained the old name for his mechanical fraud, "The Therapeutic Couch." Again the Post Office Department got on his trail and discovered that he was using as his chief advertising material a book, "The Human Body," which he had employed in promoting his earlier scheme. In this latest venture, according to evidence gathered by the government, Cropp's letters to prospective customers intimated that they were evidently practitioners of the healing arts, otherwise they would not be inquiring about his Couch, since he said he had for several months advertised it in professional journals. This, the Post Office declared, was a false representation, as shown by his simultaneous advertising in a cheap health periodical widely circulated among laymen as well as health-fad practitioners.

When Cropp was ordered by the Post Office Department to show cause why his Physical Improvement, Inc., should not be debarred from the mails on grounds of fraud, he presented as a witness in his behalf a naturopath licensed as such in Connecticut, Florida and the District of Columbia, and as a physiotherapist in New York state. After hearing all the evidence, the Post Office Department found that Physical Improvement, Inc., not only was a continuation of Cropp's previous fraud, and an attempt to evade the fraud order issued against Cropp and the International Health Device Corporation, but was in itself a swindle. Accordingly, a new fraud order was issued on Aug. 7, 1943 against Cropp and his latest trade designation, Physical Improvement, Inc.

Note the finding of the Post Office Department that even before the fraud order against Cropp's International Health Device Corporation had been issued (although expected) Cropp had already incorporated his latest enterprise, Physical Improvement, Inc., thus showing his determination to continue the swindle, and that in this move he was assisted by a Jay H. Radley, M.D. The only person of this name in the American Medical Directory is listed under New York City. According to the data, he was born in 1863, was graduated from the old College of Physicians and Surgeons, Chicago, in 1889 and licensed to practice medicine in thirteen states. In 1929 one of the government departments at Washington, after looking into an advertised "obesity cure," reported that some of its promotional literature referred to Dr. J. H. Radley of New York as a recognized authority on skin diseases and featural defects. It has also been reported that J. H. Radley once authored an article in a chiropractic journal and that after his name were the letters "M.D., D.C.," the "D.C." presumably standing for "Doctor of Chiropractic."

The previous fraud orders issued against the various names under which this brazen scheme was perpetrated were dealt with at considerable length in this department of THE JOURNAL for April 4, 1942, page 1240; Dec. 12, 1942, page 1243, and Feb. 19, 1943, page 537. Apparently this swindle is hard to scotch. There seems to be something appealing in the idea that one may grow tall and strong and beautiful just by lying down on a special kind of couch! When will Cropp crop up again?

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

Following are abstracts of stipulations in which promoters of "patent medicines," medical devices and cosmetics have agreed, following action by the Federal Trade Commission, to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products:

Chu Suey Gee Chinese Medicines.—These are put out under the name of the Suey Chee Herb Company, San Francisco, which is a trade name for one Chu Suey Gee. In May 1943 he stipulated with the Federal Trade Commission that he would cease representing that his pills strengthen the heart or that their use is indicated for that purpose.

Needee Acidophilus Culture and Needee Lactone.—In May 1943 the Federal Trade Commission accepted a stipulation from John T. Heinrichson, trading as Heinrichson's Natural Food Company, Chicago. In this he agreed to discontinue any advertising which represented that either of his preparations is a cure or remedy or effective in the treatment of diarrhea, intestinal flatulence, rheumatism, arthritis, metabolic disorders, hyperacidity, colitis or arteriosclerosis; that either will drive out putrefactive bacterial or toxic poisons; that through the use of these youth, beauty or lasting health can be obtained, or that any Needee food product is guaranteed by or insured against imperfections by Lloyd's of London or any other insurer or guarantor.

Security Suppositories and Stillman's Suppositories.—In April 1943 the Chicago Mail Order Company, Chicago, entered into a stipulation with the Federal Trade Commission, to the effect that it would cease representing, by use of the designation "security" or by any other means, that its suppositories give security or complete protection against conception or are nonirritating to normal vaginal tissues.

Si-Oze.—This is put out by one Berdye H. Sigel, trading as the Si-Oze Company, Chicago. In May 1943 this person stipulated with the Federal Trade Commission to discontinue any advertising which failed to reveal that excessive use of this product may be dangerous or that it should not be administered to infants and younger children except on competent advice, or used by persons suffering from high blood pressure, heart disease, diabetes or thyroid trouble, and further, that frequent or continued use of this preparation may cause nervousness, restlessness or sleeplessness. The stipulation provided, however, that such advertising need contain only the statement, "Caution: Use only as directed" when the labeling contains a warning to the same effect.

Correspondence

FAILURE OF THE SWEAT MECHANISM IN THE DESERT

To the Editor:—I should like to comment briefly on the report in THE JOURNAL February 19 concerning the subject of "Failure of the Sweat Mechanism in the Desert" and "Thermogenic Anhidrosis."

In view of the great importance of this subject as regards both the armed forces and industry, reliable data concerning these functions is greatly needed. There is no doubt that prolonged exposure to heat, particularly when considerable physical activity is required, leads in the course of time, to serious salt depletion (NaCl) associated with symptoms, of serious muscular weakness, muscular and abdominal cramps, drowsiness, loss of appetite and such central disturbances as increased irritability, nausea, vomiting, vertigo, fever, visual disturbances and delirium, in some instances culminating in tetany and collapse.

Anhidrosis has been found to be most frequently associated with chloride deprivation and dehydration. Since the work of Bunge and others has shown that the largest part of the approximately 100 Gm. of sodium chloride contained in the average human body is to be found in the tissues (approximately 60 per cent or more), it is reasonable to assume that a considerable amount of chlorides can be lost without a corresponding lowering of the blood chloride level, which the organism attempts to maintain tenaciously.

The authors of the report apparently assume that the maintenance of the blood chloride level within normal limits in a majority of the cases which they have observed was sufficient evidence to justify the assumption that a sodium chloride deficiency did not exist (see comments by Peters, pages 299 and 300 of Duncan's "Diseases of Metabolism"). However, it is interesting to observe that in case 6, as reported, a satisfactory minimum replacement of the chloride loss (2,000 cc. of 5 per cent dextrose in isotonic solution of sodium chloride) had been given on admission, and that this was followed by a prompt remission of the clinical symptoms, with a return to normal sweat function within twenty-four hours. Further they point out that all of their patients were given some form of salt therapy, 4 to 6 Gm. daily as oral tablets, in addition to using drinking water containing 0.1 per cent solution of sodium chloride. This addition to their daily intake they noted failed to relieve the symptoms. Most authors agree that such patients should receive a minimum of 25 Gm. of sodium chloride added to their intake within the first twenty-four hours, preferably as isotonic solution intravenously in addition to the oral intake. Under desert conditions this would seem indeed a minimum requirement in order to facilitate recovery from severe chloride depletion.

The authors note further that following recovery of the sweating function the symptoms could not be provoked when the patient was temporarily subjected to excessive heat of the desert sun.

Here we must raise the question as to whether their salt depletion and dehydration had been partially or completely dissipated before they could stand such a test satisfactorily, especially in view of the return of the sweat function.

The authors' conclusion that salt is not indicated and of no therapeutic value is a dangerous assumption in view of the existing physiologic evidence to the contrary. Do their observations rest on sufficient experimental evidence to support such a conclusion?

MICHAEL M. MILLER, Ellis Island 4, N. Y.
Assistant Surgeon (R), U. S. Marine Hospital.

To the Editor:—In the article on "Failure of the Sweat Mechanism in the Desert" (THE JOURNAL February 19) by Wolkin, Goodman and Kelley a new syndrome is presented and an attempt is made to "demonstrate that the presence or absence of normal sweating function is the determining factor in the production of the syndrome."

In the article no mention is made of the cortical influence on general body sweating. It is a physiologic fact that during mental stress on a very hot day there is a suppression of general body sweating. (Kuno, Yas: The Physiology of Human Perspiration). The anxiety state, which is a stimulus for palmar sweating, may during extreme elevations of temperature inhibit both palmar and general body sweating. This paradoxical inhibition of sweating also occurs in severe heat strokes. It seems unreasonable to believe that this inhibition seen in heat stroke is caused by paralysis of the sweat glands, for there is a prompt restoration of sweating when the patient is placed in cool surroundings. The limitation of sweating to the face and neck is difficult to explain. The possibility of local reflex action to these exposed parts cannot be excluded.

A review of the symptoms in the 8 cases presented by the authors suggests a psychogenic factor: "shaky and weak" (case 1), "head whirling" (case 2), " all in feeling" (case 3), "light headed and extremely weak" (case 4), "light headed" (case 5), "dizzy while on the firing range" (case 6), "lost consciousness for a few seconds" (case 7), "burning up" (case 8).

It is noteworthy that all the patients improved when placed in a different environment. Obviously, if psychic influences were the basis for this improvement, it is understandable why there was no disturbance in the blood chlorides.

In summary it is felt that the syndrome described by the authors is fundamentally a psychosomatic phenomenon. The inhibition of sweating is secondary. Further investigations from a psychosomatic point of view are indicated.

JACOB J. SILVERMAN,
Captain, M. C., A. U. S.
VERNON E. POWELL,
Lieutenant Colonel, M. C., A. U. S.

ANHIDROSIS FOLLOWING EXPOSURE TO EXTREME HEAT

To the Editor:—In THE JOURNAL, February 19, Wolkin, Goodman and Kelley reported the interesting syndrome of anhydrosis following exposure to extreme heat. One case of this syndrome was studied in Louisiana during the summer of 1943. This man presented the identical picture which they describe: of uneventful previous exposure to heat with a sudden onset of weakness and malaise but no true heat or sun stroke following a particularly difficult march on a hot, humid day. On examination he showed dry skin of the extremities and trunk with pronounced sweating of only the face and neck, which they found characteristic. In the cool of the hospital he was quite comfortable unless he drank hot liquids, at which time flushing of the face associated with profuse sweating of the face and neck was reproduced. The same effect in the areas was produced by the injection of physostigmine. The findings were corroborated with Minor's starch-iodine technic.

The local skin changes are of great interest to the dermatologist and perhaps should be more strongly emphasized. In addition to the scaling, fine papular lesions which the authors describe, our patient later developed over the extensor surfaces of his arms and legs and on his trunk another distinct derma-

tosis. It consisted of superficial, more or less circinate areas of slight erythema with moderate white scaling and mild pruritus. The scaling was patchy and similar to icthyosis but could be differentiated from congenital icthyosis without difficulty. Two other diseases which may have a similar appearance are pityriasis rosea and tinea circinata. The coloring, distribution and course help differentiate it from the former, while the very superficial character and lack of fungi in the scales prove it different from the latter.

About 20 additional patients were seen in consultation for a skin disease which was identical in distribution, appearance, symptoms and course with that described. None of these patients, as far as could be determined, had had an episode of "thermal anhidrosis." All of them had spent the summer in Louisiana, however, and had been exposed to high temperatures. A diagnosis of asteatosis was made in each case, and it was felt that it might be a late sequela of severe prickly heat (miliaria rubra) and was somehow caused by the excessively hot climate.

The patient with anhidrosis, as well as the others, obtained satisfactory relief by using plain greasy ointments and avoiding excessive bathing. Numerous colored photographs of this type of asteatosis, as well as of the starch-iodine demonstration of anhidrosis, were made. It was possible thereby to demonstrate the unique nature of these two conditions to other medical officers.

I should like to congratulate the authors of the article on "thermal anhidrosis" for defining what is apparently a new syndrome. Added to it, however, should be "thermal asteatosis," which may or may not be associated with the anhidrosis and which is commonly the patient's only complaint. Further, physiologic and microscopic study of these diseases will undoubtedly give additional valuable information of the complicated mechanisms of adjustment of the human organism to hot climates.

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MODES OF SPREAD OF POLIOMYELITIS

To the Editor:—Since the appearance in THE JOURNAL (Dec. 4, 1943) of an editorial on "The Modes of Spread of Poliomyelitis Virus" some discussion has arisen on several points (Ward, Melnick and Paul, correspondence, February 26). The editorial represented a comment on a paper of Maxcy and Howe, "The Significance of the Finding of Infantile Paralysis Virus in Sewage," which appeared in the *Sewage Works Journal* for November 1943.

Drs. Ward, Melnick and Paul are chiefly concerned with the editorial but also take exception to a quotation from the summary of Maxcy and Howe's paper, namely that "the disease would not attack children preponderantly, as is the case were it transmitted by the fly or any other insect." While this statement is obviously erroneous as it stands without context in the summary, in the body of the paper the authors quoted from W. H. Frost to the effect that insect transmission of poliomyelitis or any other disease could not give such a preponderance of cases among children in a nonimmune population. This point is a fine one and not well taken, since it is extremely doubtful whether there has ever been any record of a virgin soil epidemic. Nevertheless, as stated in the paper, the role of the fly in the transmission of poliomyelitis is still undetermined.

KENNETH F. MAXCY, M.D.
HOWARD A. HOWE, M.D., Baltimore.

INTERCOSTAL NERVE BLOCK

To the Editor:—In THE JOURNAL, February 19, Dr. E. I. Evans described the method of intercostal anesthesia in the shocked patient and credited it to Bartlett (1940). This method has been described and illustrated in my short monograph on Local Anesthesia (Philadelphia and London, W. B. Saunders Company, 1928, p. 117). It was used during the first world war by a number of military surgeons, notably Franz. The block is especially useful in lateral, subcostal or paramedian incisions, where only one side needs to be injected and where the nerve supply from the other side can be excluded by a subcutaneous infiltration in the midline. It is a simple procedure which, combined with morphine-scopolamine, allows a rapid exploration of the traumatized abdomen. The case reports of Dr. Evans certainly testify for the usefulness of this method under battle conditions. If pentothal sodium could be eliminated it might add to the safety of the procedure, since experienced anesthetists may not always be on hand.

The closure of the abdomen can be facilitated by infiltration of the abdominal muscles and mainly the parietal peritoneum through the abdominal wound.

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Chicago.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, April 8, page 1081.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, Oct. 24-26. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ALASKA: Juneau, September 5. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

ARKANSAS:* *Eclectic.* Little Rock, June 8. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: San Francisco, June 27-29 Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento.

DELAWARE: Dover, Oct. 10-12. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

FLORIDA: * Jacksonville, June 26-27. Sec., Dr. W. M. Rowlett, Box 786, Tampa.

IDAHO: Boise, July 11. Dir., Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Bldg., Boise.

INDIANA: Indianapolis, May 2-4. Sec., Board of Medical Registration and Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

KENTUCKY: Louisville, Sept. 11-12. Sec., State Board of Health, Dr. Philip E. Blackerby, 620 S. Third St., Louisville.

MARYLAND: *Medical.* Baltimore, June 13-16. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 20-21. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MINNESOTA: * Minneapolis, April 18-20. Sec., Dr. J. F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSOURI: St. Louis, August. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

NEVADA: Carson City, May 1. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW JERSEY: Trenton, June 20-21. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW YORK: Albany, Buffalo, New York City and Syracuse, June 26-29. Sec., Dr. R. R. Hannon, Education Bldg., Albany.

NORTH CAROLINA: Raleigh, September. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, July 5-8. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, July 4. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON: * *Endorsement.* Portland, April 22. Exec. Sec., Miss L. M. Conlee, 608 Failing Bldg., Portland.

SOUTH CAROLINA: Columbia, June 26-28. Sec., Dr. N. B. Heyward, 1329 Blandena St., Columbia.

VERMONT: Burlington, Sept. 12-14. Sec., Dr. F. J. Lawliss, Richford.

WEST VIRGINIA: Charleston, May 1-3. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston.

WISCONSIN: * Milwaukee, June 27-29. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, June 5-6. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

DISTRICT OF COLUMBIA: Washington, April 17-18. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: Gainesville, June 8. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.

MICHIGAN: Ann Arbor and Detroit, May 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

NEBRASKA: Omaha, May 2-3. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.

RHODE ISLAND: Providence, May 17. Sec., Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Vermillion, June 4-5. Sec., Dr. G. M. Evans, Yankton.

TENNESSEE: Nashville and Memphis, June 23-24. Sec., Dr. O. W. Hyman, Memphis.

WISCONSIN: Madison, April 1. Sec., Prof. R. N. Bauer, 152 W. Wisconsin Ave., Milwaukee.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Failure to Diagnose Osteomyelitis.—The plaintiff was bitten by a coyote, Nov. 30, 1937, receiving a deep puncture wound and abrasions on the back of the hand. The defendant physician was consulted December 2 and placed a "wick," composed of gauze, in the puncture wound to aid drainage and cleaned, dressed and bandaged the hand. This treatment was continued for several days, but the hand became more swollen and painful. By December 10 the plaintiff's condition had become bad, his temperature had risen considerably and he suffered such pain below his left knee that he was unable to leave his home and the physician was obliged to call on him there. The physician diagnosed the pain in the knee and leg as rheumatism and prescribed the internal and external use of wintergreen. The pain did not abate, and the physician next prescribed a hot pad to be placed on the knee and leg. The patient continued to have chills and fever, his temperature remained extremely high, his pain became more excruciating, and his hand, leg and knee became more swollen. The physician then prescribed milk poultices for the hand but the patient steadily grew worse, he could not sleep or rest and finally he became delirious. The physician, however, vetoed any suggestion of hospitalization. Finally, on December 19, neighbors, without the physician's knowledge, took the patient to a hospital in a town about 30 miles from the patient's home in Castle Dale, Utah. At the hospital, Dr. Hubbard took charge of the case and after a general exploratory operation ascertained that the patient had a general septicemia and acute osteomyelitis of the left tibia. Recovery was poor. Four months later the patient was removed to a veterans' hospital in Salt Lake City, where he remained for over a year. By this time he had developed chronic osteomyelitis. About a year later he was admitted to the Marine Hospital in San Francisco, where his leg was amputated at the junction of the middle and lower thirds of the femur. Subsequently the patient brought suit contending that the physician had been negligent by failing (1) to diagnose the patient's condition correctly as general septicemia and acute osteomyelitis in the left tibia; (2) timely to hospitalize the patient and to operate, and (3) to give blood transfusions, all of which contributed to the patient's loss of his leg, so it was alleged. From a judgment in favor of the patient the physician appealed to the Supreme Court of Utah.

In malpractice cases, said the Supreme Court, to determine whether or not a physician has been negligent in the treatment of a patient, it is necessary to determine whether or not he has used or failed to use the ordinary care and skill required of physicians in the community which he serves. What is the ordinary care and skill required of a physician in the community in which he serves must necessarily depend on expert testimony. There was expert testimony in this case that a physician who used the ordinary skill, care and knowledge required of him in Castle Dale, Utah, in 1937 would have known from the symptoms of the patient and his case history that the patient was suffering from a general blood stream infection and that osteomyelitis should have been suspected. The proper treatment for septicemia at that time and place was to put the patient to bed and see that he had plenty of rest, liquids and a good diet; that the patient be made as comfortable as possible because it is while the patient is sleeping or resting that the body is best able to combat a bacterial infection in the blood stream. The defendant did not instruct the patient to remain in bed and rest, neither did he prescribe plenty of fluids and a proper diet. When the patient complained of pain in his knee and leg defendant diagnosed it as rheumatism and prescribed treatment for that ailment. This, in the opinion of the court, constituted negligence. In arriving at this conclusion the court relied on *Baird* v. *National Health Foundation,* 235 Mo. App. 594, 144 S. W. (2d) 850, where it was held that it was negligence for physicians to fail to apprise themselves of symptoms which are present and to diagnose and correctly treat the patient on the basis of those symptoms. Regardless of what skill is used, that court held, if a physician fails in his duty to observe and discover a patient's illness, he is negligent. In this case, continued the court, there was sufficient evidence for the jury to find that the physician was negligent in having failed properly to observe the patient's condition and in failing correctly to treat him for a staphylococcic infection by failing both before and after December 10 to prescribe that he remain in bed and rest, take plenty of fluids and eat proper food.

The next question to be determined, said the court, is whether or not the physician was negligent in failing to hospitalize timely and to operate on the patient. At the trial there was evidence that immediately after the patient was taken to the hospital roentgenograms were taken of his leg and knee, that these roentgenograms did not disclose any abnormality and that therefore an exploratory operation was performed, revealing the presence of osteomyelitis in the upper tibia, about 4 or 5 inches being involved. Medical expert witnesses testified that the disease at that time was not in an advanced stage because the roentgenograms did not show any bone involvement. Osteomyelitis, the court observed, is a pus-forming disease which causes decalcification, and the length of time it takes to destroy the bone depends on the virulence of the attacking bacteria. From the fact that only 4 or 5 inches of the tibia had been involved at the time of the operation, the medical expert witnesses were of the opinion that the infection had been localized at that point only a few days. These physicians further believed that earlier hospitalization and operation would not have been beneficial because there is a tendency for the disease when it has localized to wall itself off and it is better to allow that process to continue so that when the operation is performed there will be less likelihood of spreading the infection. From this, said the court, it will be noted that there was insufficient evidence to be submitted to the jury on the question of whether or not the physician was negligent in having failed to hospitalize and operate on the patient sooner.

The patient contended that the physician was negligent in failing to give blood transfusions, since blood transfusions are necessary to combat osteomyelitis. Osteomyelitis, said the court, is a blood stream infection carried within the bone. One medical expert witness testified that when a patient has a badly infected hand due to a coyote bite, suffers from chills and fever, has a general blood stream infection, is very ill, suffers constant pain in his leg below the knee and when that is touched suffers greater pain, he should be prepared for an operation to determine whether he has acute osteomyelitis by being given proper rest, administration of fluids and blood transfusions. Whether blood transfusions are necessary depends on a laboratory test of the blood. Usually in cases of acute osteomyelitis there is a likelihood of a rapid blood destruction; that blood transfusions are necessary to alleviate this condition, and it is dangerous to delay giving blood transfusions because the real danger in acute osteomyelitis is sepsis in the system. Another expert was of the opinion that, unless a blood test showed a destruction of the blood, blood transfusions were not beneficial. The defendant physician had taken no blood test of the patient, and therefore there was no evidence in the record of the actual condition of his blood. However, observed the court, the defendant physician should not be allowed to take advantage of his own failure to act, and we believe there was enough evidence to go to the jury on the question of the negligence of the defendant for failure to prescribe blood transfusions.

The most important question, said the court, however, remains to be settled; namely, was the negligence of the defendant physician the proximate cause of the ultimate injury suffered by the plaintiff? Unless there is evidence showing the causal relation between the negligence of the physician and the ultimate injury there is no liability on the part of the physician. Medicine is not an exact science and it is not necessary that the proximate cause of an injury sustained through the negligence of a physician be proven with exactitude. It is enough if there is substantial evidence to support the judgment. If the injury sustained could be attributed to two or more causes, one of which was the negligence of the physician, it would be a question for the jury to determine which was the proximate cause of the injury. Had the patient pleaded that the physician had negligently failed properly to treat his injuries, commencing from December 2, when he was first employed, instead of only from December 10, by failing to prescribe that he remain in bed, get plenty of rest, take plenty of fluids and eat proper food, which failure resulted in a blood stream infection which in turn caused the osteomyelitis, we are not prepared to say that there was insufficient evidence to go to the jury on the question of proximate cause. Plaintiff, however, based his case on the failure of the physician to recognize that osteomyelitis had set in by December 10 and to treat him for it properly by administering blood transfusions and operating in time. There was no expert evidence in this case that if the physician had done these things at that time the condition which caused the eventual amputation of the patient's leg could have been avoided. No expert witness testified that had the physician recognized the symptoms of osteomyelitis he could have alleviated or cured it by using the ordinary skill, care and knowledge of a physician practicing in that vicinity. As to blood transfusions, one medical witness did testify that it was beneficial in blood stream infections but did not testify that had there been transfusions the end result might have been avoided. Osteomyelitis being a disease the cause and cure of which is peculiarly within the knowledge of medical men and not a matter of common knowledge, it is necessary to have expert testimony concerning the effect of the negligence of a physician on the end result. In this case there was no evidence that anything the physician did or failed to do after osteomyelitis developed caused the end result. In the absence of such expert testimony there is nothing on which a jury can base its finding on the proximate cause of the injury. A jury may not conjecture or speculate but must have substantial evidence on which to base a verdict. The judgment in favor of the patient was accordingly reversed and a new trial was ordered.—*Anderson v. Nixon, 139 P. (2d) 216 (Utah, 1943).*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Montgomery, April 18-20. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.

American Association for the Surgery of Trauma, Chicago, June 9-10. Dr. Gordon M. Morrison, 520 Commonwealth Ave., Boston, Secretary.

American Association for Thoracic Surgery, Chicago, May 5-6. Dr. Richard H. Meade Jr., Kennedy General Hospital, Memphis, 15, Tenn., Secretary.

American Association of Genito-Urinary Surgeons, Stockbridge, Mass., June 8-10. Dr. Charles C. Higgins, 2020 E. 93d St., Cleveland, Secretary.

American Association of Industrial Physicians and Surgeons, St. Louis, May 8-11. Dr. Edward C. Holmblad, 28 East Jackson Blvd., Chicago, Managing Director.

American Association of Plastic Surgeons, Philadelphia, May 25-27. Dr. Frederick A. Figi, 102 Second Ave., S.W., Rochester, Minn., Secretary.

American Association on Mental Deficiency, Philadelphia, May 11-15. Dr. Neil A. Dayton, Mansfield Training School, Mansfield Depot, Connecticut, Secretary.

American Broncho-Esophagological Association, New York, June 6. Dr. Paul H. Holinger, 700 N. Michigan Ave., Chicago, Secretary.

American Laryngological Association, New York, June 7-8. Dr. Arthur W. Proetz, 3720 Washington Blvd., St. Louis, 8, Secretary.

American Laryngological, Rhinological and Otological Society, New York, June 9-10. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.

American Neurological Association, New York, May 19-20. Dr. Henry Alsop Riley, 117 E. 72d St., New York 21, Secretary.

American Ophthalmological Society, Hot Springs, Va., May 29-31. Dr. Walter S. Atkinson, 129 Clinton St., Watertown, N. Y., Secretary.

American Psychiatric Association, Philadelphia, May 15-18. Dr. Winfred Overholser, St. Elizabeth's Hospital, Washington, D. C., Secretary.

American Psychoanalytic Association, Philadelphia, May 13-15. Dr. Robert P. Knight, 3617 W. Sixth Ave., Topeka, Kansas, Secretary.

American Society for Clinical Investigation, Atlantic City, May 8. Dr. Wesley W. Spink, University Hospitals, Minneapolis, Secretary.

American Therapeutic Society, Chicago, June 10. Dr. Oscar B. Hunter, 1835 I St., N.W., Washington, 8, D. C., Secretary.

Arkansas Medical Society, Little Rock, April 17-18. Dr. W. R. Brooksher, 602 Garrison Avenue, Fort Smith, Secretary.

Association of American Physicians, Atlantic City, May 9. Dr. Joseph T. Wearn, Lakeside Hospital, Cleveland, Secretary.

California Medical Association, Los Angeles, May 7-8. Dr. George H. Kress, 450 Sutter Street, San Francisco 8, Secretary.

Connecticut State Medical Society, Bridgeport, May 2-4. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.

Georgia, Medical Association of, Savannah, May 9-12. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.

Illinois State Medical Society, Chicago, May 16-18. Dr. Harold M. Camp, 224 S. Main St., Monmouth, Secretary.

Iowa State Medical Society, Des Moines, April 20-21. Dr. Robert L. Parker, 3510 Sixth Avenue, Des Moines, Secretary.

Kansas Medical Society, Topeka, May 10-11. Dr. F. R. Croson, 112 West Sixth Street, Topeka, Secretary.

Louisiana State Medical Society, New Orleans, April 24-26. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, 13, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, April 25-26. Dr. W. Houston Toulson, 1211 Cathedral St., Baltimore, Secretary.

Massachusetts Medical Society, Boston, May 23-24. Dr. Michael A. Tighe, 8 Fenway, Boston 15, Secretary.

Mississippi State Medical Association, Jackson, May 9-10. Dr. T. M. Dye, Box 295, Clarksdale, Secretary.

Missouri State Medical Association, Kansas City, April 23-25. Dr. Ralph L. Thompson, 634 N. Grand Blvd., St. Louis, Secretary.

National Tuberculosis Association, Chicago, May 10-12. Dr. Charles J. Hatfield. 1790 Broadway, New York, Secretary.

Nebraska State Medical Association, Omaha, May 1-4. Dr. R. B. Adams, 416 Federal Securities Bldg., Lincoln, Secretary.

New Hampshire Medical Society, Manchester, May 16. Dr. C. R. Metcalf, 5 S. State St., Concord, Secretary.

New Jersey, Medical Society of, Atlantic City, April 25-27. Dr. Alfred Stahl, 55 Lincoln Park, Newark, Secretary.

New York, Medical Society of the State of, New York, May 8-11. Dr. Peter Irving, 292 Madison Ave., New York 17, Secretary.

North Carolina, Medical Society of the State of, Pinehurst, May 1-3. Dr. R. D. McMillan, P. O. Box 232, Red Springs, Secretary.

North Dakota State Medical Association, Fargo, May 7-9. Dr. L. W. Larson. 221 5th Street, Bismarck, Secretary.

Ohio State Medical Association, Columbus, May 2-4. Mr. Charles S. Nelson, 79 E. State St., Columbus, Executive Secretary.

Oklahoma State Medical Association, Tulsa, April 24-26. Dr. L. J. Moorman, 1200 N. Walker St., Oklahoma City, Secretary.

Rhode Island Medical Society, Providence, May 24-25. Dr. William P. Buffum, 122 Waterman St., Providence 3, Secretary.

Society of American Bacteriologists, New York, May 3-5. Dr. W. C. Frazier, 310 Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.

South Dakota State Medical Association, Huron, May 21-23. Dr. Roland G. Mayer, 22½ S. Main St., Aberdeen, Secretary.

Texas, State Medical Association of, Dallas, May 10-11. Dr. Holman Taylor, 1404 W. El Paso Street, Fort Worth, Secretary.

West Virginia Medical Association, Wheeling, May 15-16. Mr. Charles Lively, P. O. Box 1031, Charleston, Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

67:1-88 (Jan.) 1944

*Prophylaxis of Measles with Convalescent Serum: Principal Factors Influencing Results. M. Stillerman, H. H. Marks and W. Thalhimer. —p. 1.

*Attack Rate and Incubation Period of Measles: Significance of Age and of Conditions of Exposure. M. Stillerman and W. Thalhimer. —p. 15.

Immunity to Tetanus Induced by Third Dose of Toxoid Three Years After Basic Immunization: Based on Study of 38 Allergic Children. M. M. Peshkin.—p. 22.

Subclinical Vitamin Deficiency: VI. Thiamine in Skeletal Muscle of Infants and Children. Mildred Carleen Hulse, N. Weissman, Virginia Rowland, R. Gross and J. W. Ferrebee.—p. 30.

Hypervitaminosis A and Carotenemia. H. W. Josephs.—p. 33.

Tularemic Meningitis: Report of Case and Summary of Previously Reported Cases. J. K. David Jr. and J. N. Owens Jr.—p. 44.

Use of Evaporated Milk without Added Sugar for Feeding of Infants. H. McCulloch.—p. 52.

Convalescent Serum in Prophylaxis of Measles.—Stillerman and his associates investigated the measles-protective properties of convalescent serum and the factors that influence the results of its use, such as age of contact, dosage of serum, interval between exposure and injection, and duration and intimacy of exposure. Since a certain proportion of susceptible persons normally escape infection, allowance has been made for this on the basis of a control study of contacts who have not received injections. From 1938 to 1941 a group of 502 intimately exposed susceptible family contacts from 6 months to 15 years of age were given injections of convalescent measles serum. A group of 245 subjects of similar ages who had not received convalescent serum served as controls. In the control group the rate of immunity varied with age. Of children 6 months to 11 months of age one third did not have measles on first exposure; of those between 1 and 7 years 10 to 14 per cent escaped the disease; of those from 8 to 9 years of age 31 per cent were immune, and of the small group between 10 and 15 years of age 85 per cent were immune. Complete protection was obtained by 50 per cent of the 502 children. Modified measles occurred in 49 per cent and unmodified measles in 1 per cent. The rate of complete protection, analyzed according to the interval between the exposure and the injection, showed no significant difference between the fourth and the seventh day. However, on the eighth day after exposure, even though the serum had a definite modifying effect, it did not prevent measles. Mild complications developed in only 3, or 1 per cent, of the 502 contacts who received injections of serum. Complete protection is recommended for all exposed healthy susceptible children under 2 years of age, because it postpones the attack until they are older, when there is a reduced case fatality rate, and is advised also for contacts over this age who are acutely or chronically ill. Modified measles is indicated for healthy children over 2 years of age, because this condition is a mild disease rarely associated with complications and is followed by strong and lasting immunity. For complete protection the optimum dose after an exposure of four to seven days is 10 cc. for contacts 6 to 11 months of age, 15 cc. for those 12 to 23 months and 20 cc. for those 2 and 3 years of age. For healthy contacts 4 years and over, complete protection is not worth striving for. If modified measles is desired, 5 cc. is sufficient between the fourth and the eighth day after exposure for contacts up to 24 months of age, and 10 cc. for those older.

Attack Rate and Incubation Period of Measles.—Stillerman and Thalhimer studied certain aspects of the attack rate of measles in 266 intimately exposed susceptible family contacts 1 month to 14 years of age. Their observations were made in the 1940-1941 epidemic in New York City. They found that the secondary attack rate was 75 per cent. Age was the principal factor influencing the secondary attack rate of intimately exposed children. This attack rate was lowest for children in early infancy, highest for those 1 to 7 years of age (80 to 90 per cent) and sharply lower for those in the 10 to 14 year group (15 per cent). Of 21 children 6 months to 10 years of age who escaped measles on one exposure and were reexposed, about one half contracted the disease. Hospitalization of patients after the appearance of the rash did not lower the secondary attack rate of the intimately exposed susceptible children. An increased intensity of exposure as measured by simultaneous contact of susceptible children with more than 1 patient with measles in nine families did not increase the incidence of the disease. The incubation period of measles was ten to fourteen days for 80 per cent of the contacts, fifteen to nineteen days for 14 per cent and less than ten days for 6 per cent. The proportion of patients with an incubation period of fifteen days or more was significantly greater in the 12 to 23 month age group.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

28:1-132 (Jan.) 1944

*Long-Term Results in Treatment of Latent Syphilis. T. H. Diseker, E. G. Clark and J. E. Moore.—p. 1.

Studies in Syphilis: IV. Relation Between Blood Serologic Tests and Anatomic Lesions at Autopsy. B. Black-Schaffer and P. D. Rosahn. —p. 27.

*Value of Dark Field Examination of Lymph Nodes in Diagnosis of Early Syphilis. A. B. Loveman and R. P. Morrow Jr.—p. 44.

Dark Field Examination of Material from Lymph Node Punctures: Report of 2 Cases with no Evident Primary Lesions. O. F. Agee. —p. 57.

Experimental Prophylaxis of Chancroid. F. C. Combes and O. Canizares.—p. 59.

Local Application of Sulfonamide Ointments in Treatment of Acute Gonococcal Urethritis in Male. O. F. Cox.—p. 66.

Dihydroxypropyl Bismuthate Orally in Treatment of Syphilis: Clinical and Chemical Study (Preliminary Report). R. Nomland, L. M. Wheeler, R. G. Carney, F. A. Kuever and E. G. Gross.—p. 68.

Intraurethral Chancres. A. B. Loveman and R. P. Morrow Jr.—p. 79.

Decrease of Prothrombin Concentration in Massive Arsenotherapy: Preliminary Report. F. Kalz and L. C. Steeves.—p. 89.

Technic of Cisternal Puncture in Modern Treatment of Syphilis. L. Spiegel.—p. 96.

Trial Experiments on Use of Para-Aminobenzoic Acid to Inhibit Toxic Reactions in Treatment of Neurosyphilis with Pentavalent and Trivalent Arsenicals: Report of Failure to Prevent Secondary Reactions. A. S. Rose, L. D. Trevett, H. C. Solomon and J. H. Sandground. —p. 103.

Treatment of Latent Syphilis.—Diseker and his associates define latent syphilis as that stage of infection in which the patient, having no symptoms or physical signs of syphilitic disease, is recognizable as syphilitic only by means of a positive laboratory test of the blood. The only justification for submitting him to the risks of antisyphilitic treatment is for the protection of public health (of importance only if his infection is recent) and for the purpose of preserving his health and of preventing the development of late manifestations of syphilis. In the material reviewed the diagnosis of latent syphilis rested on (*a*) repeated positive blood serologic tests (the vast majority of cases), (*b*) in seronegative patients a reliable history or (*c*) in seronegative women the birth of a syphilitic child. Excluded are all patients with originally abnormal spinal fluids because of the wide difference in prognosis of latent syphilis and asymptomatic neurosyphilis. Among 5,326 patients with latent syphilis admitted to the medical clinic of the Johns Hopkins Hospital between 1914 and 1934 there were 926 who were observed for more than five years. These are a fairly representative sample of the total group. The final status was evaluated by physical examinations and in many patients by repeated cerebrospinal fluid examinations and radiologic study of the cardiovascular stripe. Progressions were higher among men than among women, but the differences were within sampling variation. Cardiovascular progression was more frequent among Negro men and neurosyphilis more frequent among white men. Progression was no more frequent among seroresistant patients than among those whose blood serologic test reversed in the first year of observation. Parous women progressed less frequently than did nulliparous women or men, but usually they received more treatment. Neuroprogression was approximately the same in all age groups. Benign late syphilis appeared predominantly in the age group under 30, cardiovascular syphilis after this age. The

highest proportion of progression occurred among patients receiving under fifteen arsenical injections and a corresponding number of heavy metal injections. Progressions were no more frequent among patients receiving fifteen to nineteen injections than among those receiving more treatment. The optimum amount of treatment to reduce progression to a minimum is approximately twenty injections each of an arsenical and a heavy metal.

Dark Field Examination of Lymph Nodes in Syphilis.—Loveman and Morrow studied the value of the examination of lymph nodes for Treponema pallidum by dark field. They decided to determine (1) the accuracy of this method, (2) the percentage of additional positive dark fields they could obtain with it, (3) whether or not the method could be employed in an army hospital and (4) whether, if nonpathogenic spirochetes were encountered, they were a source of confusion with Treponema pallidum. The authors made studies on 40 patients, 25 of whom had syphilitic lymphadenopathies and 15 had various types of nonsyphilitic lymphadenopathies. The technic of aspirating the contents of lymph nodes is as follows: The skin overlying the node to be aspirated is painted with any suitable antiseptic, such as tincture of iodine, metaphen or merthiolate. With use of a 20 to 22 gage needle, about 0.5 cc. of sterile distilled water is drawn up into a 5 to 10 cc. Luer syringe. The suitable node is then fixed with the fingers of one hand so as to prevent it moving away from the needle when the puncture is attempted. The needle is then inserted directly into the node. When it is certain that the node substance has been pierced, the water is injected. The needle is then rotated for thirty or forty seconds and the node is gently moved from side to side; then withdrawal of a slightly blood tinged serum is possible. A small drop is placed on a glass slide and the search is made for spirochetes. The technic is simple and easily mastered. The authors found that in every patient in whom the dark field of the local lesion was positive for T. pallidum and the nodes were sufficiently enlarged to permit aspiration the dark field examination verified the local findings. By employing aspiration dark field of lymph nodes the authors were able to increase the percentage of immediate diagnosis from 28 to 76. In neither syphilitic nor nonsyphilitic lymph nodes were spirochetes other than T. pallidum encountered.

Annals of Surgery, Philadelphia

119:1-160 (Jan.) 1944

Experiences with Chest Wounds from Pacific Combat Area. E. Holman.—p. 1.
*Afferent Vasodepressor Nerve Impulses as Cause of Shock: Tested Experimentally by Aortic-Depressor Nerve Stimulation. D. B. Phemister, C. H. Laestar, Lillian Eichelberger and R. J. Schachter.—p. 26.
*Studies on Traumatic Shock: I. Blood Volume Changes in Traumatic Shock. E. I. Evans, M. J. Hoover, G. W. James III, and T. Alm.—p. 64.
*Liposarcoma—Malignant Tumor of Lipoblasts. A. P. Stout.—p. 86.
*Lymphosarcoma of Gastrointestinal Tract: Report of 20 Cases. B. McSwain and J. M. Beal.—p. 108.
Hypertrophic Pyloric Stenosis in Adults: Report of 2 Cases. J. E. Berk and H. J. Dunlap.—p. 124.
Experiences in War Surgery in China. P. E. Adolph.—p. 134.

Depressor Nerve Impulses in Shock.—Phemister and his collaborators found that stimulation of the aortic-depressor nerve of the rabbit may maintain the blood pressure at shock levels for hours without serious impairment of the circulation or of the body tissues. However, if continued for a longer period it may produce death from the effects of hemodilution, anoxia and damage to the vasomotor centers, a condition which may be designated as neurogenic shock. Plasma proteins are lost from the blood apparently as a result of capillary damage. Judging by the relative harmlessness of these long periods of low blood pressure in rabbits, by the inability to produce more than a brief slight lowering of blood pressure by direct stimulation of somatic nerves which carry impulses from traumatized fields and by the comparatively short duration of the periods of reflex lowering of blood pressure during syncope and abdominal manipulations, it is extremely improbable that "primary shock" is ever produced in man by the action of afferent depressor nerve impulses. The use of the term "primary shock" to denote such a condition should be abandoned. When the blood pressure of the rabbit was first lowered to shock levels by hemorrhage and the aortic-depressor nerve then stimulated, the additional lowering of blood pressure would tend to hasten death to some extent. Also when the blood pressure was first maintained at shock levels for periods of one to four hours by aortic-depressor nerve stimulation and the rabbits then bled, there was usually some reduction in ability to tolerate loss of blood. Judging from the results of combining hemorrhage and aortic-depressor nerve stimulation in lowering blood pressure and producing shock in rabbits, the occurrence in man of fainting or of a reflex fall of blood pressure from abdominal manipulation in the presence of low blood pressure produced by hemorrhage may constitute a contributing factor to shock. Clinical experience also supports this contention to some extent.

Blood Volume Changes in Traumatic Shock.—Evans and his collaborators estimated the plasma volume in patients who were in shock as a result of various types of trauma. They also attempted to correlate these blood volume studies with the manifestation of signs of shock in these patients. It was their aim to determine the relative importance of blood loss as an initiating and sustaining factor in traumatic shock. They had clinical shock material similar to that seen in modern warfare. One of their hospitals cares for a large urban Negro population, among which knife and gunshot wounds of the extremities, chest and abdomen are frequent. The authors also studied a considerable number of traumatic injuries of the skeletal structures caused by automobile and industrial accidents. With use of the Gregersen-Gibson method for the estimation of plasma volume, it has been found that signs of severe shock do not ordinarily appear unless the blood loss is greater than 15 per cent. The average blood loss in severe traumatic shock has been about 38 per cent, no matter what the nature of the trauma. Analysis of dye disappearance curves revealed no evidence of increased generalized capillary permeability in traumatic shock. From hematocrit studies it is evident that what is lost early in traumatic shock in the zone of injury is whole blood, not plasma. Severe depletion of blood volume appears to be the most important single factor in the causation of traumatic shock. A decline in blood pressure levels is the most valuable clinical sign in the early diagnosis of clinical shock.

Liposarcoma: Malignant Tumor of Lipoblasts.—Stout records the group of 41 cases of liposarcoma which have accumulated in the Laboratory of Surgical Pathology of Columbia University during the past thirty-seven years and integrates the information gained from them with what can be gleaned from 134 previously reported cases. These tumors tend to form large bulky masses, with a predilection for the thigh and extraperitoneal tissues but with occasional appearance in many other regions. They exhibit great variations in speed of growth, they are sometimes multiple and the more malignant forms metastasize usually either to the lungs or to the liver. These tumors are frequently mottled with yellow because of their lipoid content and are often slimy from the formation of mucoid material. Microscopically they can be divided into one well differentiated, less malignant group which simulates the appearance of ordinary embryonal fat and three other poorly differentiated more malignant groups resembling respectively atypical ordinary embryonal fat, atypical brown fat with the formation of rounded lipoblasts, and finally a group showing these two elements in combination. Probably as a result of metaplasia these tumors can on occasion form other tissues such as reticulin and bone. This versatility suggests that there are probably not separate embryonal stem cells for adipose tissue and brown fat but that the two spring from a common ancestor segregated from the primitive mesenchyme.

Lymphosarcoma of the Gastrointestinal Tract.—McSwain and Beal review 20 cases of lymphosarcoma of the gastrointestinal tract that were treated in the New York Hospital during the past nine years. The number of carcinomas of the gastrointestinal tract seen during this period shows that there is 1 case of lymphosarcoma to every 51 cases of carcinoma. All areas of the gastrointestinal tract except the duodenum were involved. There was 1 lymphosarcoma of the esophagus, the stomach was the site of the lymphosarcoma in 7 patients, the small intestine in 3 patients, the appendix in 2 patients and

the large intestine in 7 patients. Lymphosarcoma of the gastrointestinal tract is rarely recognized before operation. The survival of the patient is influenced more by the site and extent of the growth than by the histologic type of neoplasm or the age of the patient. The prognosis depends largely on whether the lymphosarcoma is localized and can be treated as an isolated lesion or whether a general spread has occurred. The 6 patients in whom the lesion was sufficiently localized to allow extirpation have survived from two to seven years without receiving roentgen therapy. Of the 6 patients given roentgen therapy alone, only 2 are without evidence of recurrence. In 2 cases resection of the lesion was followed by irradiation without evidence of a return of tumor. In 4 resection followed by irradiation gave poor results. In 1 case irradiation was started five months after operation, obviously too late for maximum prophylactic value; in another case the therapy was tolerated so poorly that it was discontinued. Nine patients are alive and well at present, without evidence of recurrence from one year to nine years and five months since the diagnosis was established. The mortality at present is 42 per cent (9 of the 19 cases followed). In eight patients who died, the average duration of life was twenty-four months.

Bulletin New York Academy of Medicine, New York

20: 73-132 (Feb.) 1944

Treatment of Lobar Pneumonia. N. Plummer.—p. 73.
Modern Treatment of Peptic Ulcer. A. Winkelstein.—p. 87.
Digestive Tract Disturbances in Relation to Rectal and Anal Conditions. H. B. Stone.—p. 99.
Role of Internist in Management of Sterility. W. H. Cary.—p. 106.

Cancer Research, Baltimore

4:73-144 (Feb.) 1944. **Partial Index**

Lymphoid Tumors in Mice Receiving Steroid Hormones. W. U. Gardner, T. F. Dougherty and W. L. Williams.—p. 73.
Attempts to Induce Stomach Tumors: II. Action of Carcinogenic Hydrocarbons on Stock Mice. P. R. Peacock and A. H. M. Kirby.—p. 88.
Id.: III. Effects of (a) Residue of Cholesterol Heated to 300 C., and (b) Δ 3,5-Cholestadiene. A. H. M. Kirby.—p. 94.
Experimental Brain Tumors: IV. Incidence in Different Strains of Mice. H. M. Zimmerman and Hildegarde Arnold.—p. 98.
Comparative Studies on Radiosensitivity of Normal and Malignant Cells in Culture. L. Doljanski, G. Goldhaber and L. Halberstaedter. —p. 106.
Retention of Radioactive Phosphorus When Administered in Different Chemical Forms. S. Warren and R. F. Cowing.—p. 113.
Effect of Exercise on Growth of Mouse Tumor. H. P. Rusch and B. E. Kline.—p. 116.
Cutaneous Carcinoma: IV. Analysis of 20 Cases in Negroes. R. Schrek. —p. 119.
Studies in Esterase (Butyric) Activity: III. Effect of Foster Nursing on Esterase Content of Blood Serum and Liver of Strains of Mice Susceptible or Insusceptible to Mammary Cancer. V. R. Khanolkar and R. G. Chitre.—p. 128.

Diseases of Chest, Chicago

10:1-86 (Jan.-Feb.) 1944

Autonomic Nervous System in Relation to Thoracic Viscera. A. Kuntz. —p. 1.
*Atypical Pneumonia of Unknown Etiology: Clinical, Roentgenologic and Pathologic Correlation. F. B. Lusk and E. K. Lewis.—p. 19.
New Era in Fight Against Microbes. P. Schonwald.—p. 41.
Use of Sodium Hypochlorite in Concentration of Tubercle Bacilli. N. Nagle, J. Lazarov and J. C. Willett.—p. 47.
Experiences in Program for Control of Pulmonary Tuberculosis in Chicago. R. Davison and E. P. Troy.—p. 54.
Clinically Primary Tuberculosis of Pericardium. M. J. Fine and S. Katz.—p. 60.

Atypical Pneumonia of Unknown Etiology.—Lusk and Lewis studied the syndrome variously designated as primary atypical pneumonia, nonbacterial bronchopneumonia, virus pneumonia, pneumonitis, interstitial pneumonia or interstitial bronchopneumonia. While its causative agents are unknown, its kinship clinically, roentgenologically and pathologically with the group known to be of virus origin, such as influenza A or B or ornithosis (psittacosis), justifies speaking of it as a virus disease. It should not be considered a new disease, having been found in sections of lungs removed from soldiers during the Civil War (MacCallum) and preserved in the Army Medical Museum. The pathologic aspects resemble those seen in the influenzal and streptococcic pneumonias and empyemas occurring in military camps in 1918. The authors set up criteria to which the syndrome must conform before a diagnosis of atypical pneumonia of unknown etiology can be made. They studied (1) the physical and x-ray findings in atypical pneumonia, (2) the pathologic changes as seen in their own patient who died with atypical pneumonia and that submitted to them by the Army Medical Museum and (3) the types of pneumonia they observed in measles and scarlet fever. Their impressions are based on a critical analysis of about 500 patients who represented a cross section of some 6,000 cases of acute epidemic respiratory tract infection in the admissions to the Station Hospital, Fort Custer, Michigan, from Dec. 1, 1942 to June 1, 1943. Studying these 500 cases they observed that 60 per cent terminated during the period of invasion without involvement of the lungs, 15 per cent justified the diagnosis of bronchitis based on physical findings and 25 per cent presented pneumonia proved by x-ray examination. The authors emphasize that atypical pneumonia should not be considered a disease entity but part of a syndrome in which the pulmonary lesions are but one manifestation of a generalized infection. So considered it might well be a physiologic accident and not a pneumonia in the accepted sense of the term. It is an interstitial pneumonitis, and the pathologic changes are similar to those found in other virus infections of the pulmonary tract.

Florida Medical Association Journal, Jacksonville

30:269-312 (Jan.) 1944

Considerations for Better Understanding of Use of Blood Bank: Report of 4 Cases. H. H. Whitney.—p. 283.
Fatality From Air Embolism Following Attempted Abortion. R. R. Killinger and C. C. Collins.—p. 286.

30:313-360 (Feb.) 1944

Ewing's Tumor of Temporal Bone: Report of Case. S. B. Forbes. —p. 331.
A Brute: Pseudo Genus Homo. W. McKibben.—p. 336.

Journal of Bacteriology, Baltimore

47:1-114 (Jan.) 1944

Utilization of Fixed Nitrogen by Azotobacter and Influence on Nitrogen Fixation. C. K. Horner and F. E. Allison.—p. 1.
Antibacterial Action of Surface Active Cations. E. I. Valko and A. S. DuBois.—p. 15.
Microbiologic Aspects of Riboflavin: I. Introduction. II. Bacterial Oxidation of Riboflavin to Lumichrome. J. W. Foster.—p. 27.
*Microbiologic Aspects of Penicillin: VI. Procedure for Cup Assay for Penicillin. J. W. Foster and H. B. Woodruff.—p. 43.
Comparative Study of Materials Suitable for Cultivation of Clostridia. Harriette D. Vera.—p. 59.
Resistance of Meningococci to Drying. C. P. Miller and Doretta Schad.—p. 71.
Germicidal Action of Daylight on Meningococci in Dried State. C. P. Miller and Doretta Schad.—p. 79.
Observations on Effect of Ultraviolet Irradiation (Knott Technic) on Bacteria and Their Toxins Suspended in Human Blood and Appropriate Diluents. G. P. Blundell, L. A. Erf, H. W. Jones and Regina T. Hoban.—p. 85.
Demonstration of Sulfonamide Inhibitor Production by Bacteria on Agar Containing Sulfonamide. R. M. Pike and Alice Zimmerman Foster.—p. 97.
Misuse of Name "Trichophyton Rosaceum" for a Saprophytic Fusarium. C. W. Emmons.—p. 107.

Cup Assay for Penicillin.—Foster and Woodruff say that the publication of this paper was prompted by the numerous inquiries pertaining to details of the cup assay procedure following the appearance of their recent article discussing the principles, advantages and disadvantages of the various methods of assay for penicillin. The inquiries revealed that numerous features of the test which are taken for granted by workers experienced with this method are quite unknown to the great majority of people who assay penicillin and that there is no source in the literature where details of the complete procedure are available. This paper is intended to provide such information. It contains also a number of points of practical efficiency value which have evolved in a laboratory that handles 100 to 400 cup assays in quadruplicate daily. The principle of the assay is that originally described by the Oxford group, but the procedure has since undergone substantial modification. The authors evaluate the H strain of Staphylococcus aureus and a strain of Bacillus subtilis for the cup assay. They describe the preparation of the spore inoculum, the preparation of the plates, the setting up of the cups and samples, the measurement of the inhibition zones and the calculation of the results.

Kansas Medical Society Journal, Topeka

45:1-36 (Jan.) 1944

Viscerourologic Complications. O. W. Davidson.—p. 1.
Management of Bleeding Nipple. H. H. Hesser.—p. 3.
Modern Mexican Medicine. C. H. Darrow.—p. 4.

45:37-72 (Feb.) 1944

Medical Problems in the Pacific. G. W. Smith.—p. 37.
Tuberculosis: Viscerourologic Complex. O. W. Davidson.—p. 45.

Michigan State Medical Society Journal, Lansing

43:97-176 (Feb.) 1944

*Abnormal Uterine Bleeding After Middle Age. R. D. Mussey and T. R. Wilson.—p. 129.
Congenital Heart Block: Report of Case. L. T. Colvin and M. L. Lichter.—p. 138.
Aid in Abdominal Palpation. A. A. Farbman.—p. 141.
What Price General Paresis? W. Scholten.—p. 142.
Osteogenic Sarcoma of Upper Third of Femur: Well Ten Years After Disarticulation at Hip Joint. H. C. Saltzstein.—p. 145.
Primary Atypical Pneumonias of Unknown Cause: "Virus" or "Viral" Pneumonias; Case Report of Similar Disease Without Pneumonia. H. A. Reimann.—p. 147.

Abnormal Uterine Bleeding After Middle Age.—Mussey and Wilson review the records of 200 women who registered at the Mayo Clinic between July and September 1937 because of abnormal uterine bleeding. The cases were selected from 1937 so that the results of treatment could be reviewed after an interval of five years. Many women past the age of 35 or 40 view abnormal bleeding as a manifestation of "change of life" and fail to consult a physician. This results in many avoidable deaths. Although abnormal vaginal bleeding may occur without implying serious organic disease, no patient past the age of 35 years who notes abnormal uterine bleeding, especially metrorrhagia, should be dismissed until it is reasonably certain that a malignant condition does not exist. Women with such symptoms should not be given endocrine therapy until malignant disease has been ruled out. Many of the causes of abnormal vaginal bleeding can be discovered by thorough pelvic examination. This should include inspection of the urethral meatus and vaginal introitus and bimanual paipation of the cervix, uterus and adnexa. Examination of the vagina by speculum, with direct visualization of the mucous membrane and cervix, never should be omitted. Biopsy should be done of any lesion which arouses suspicion. Except in pregnancy, diagnostic curettage should be used in every instance in which there is doubt about the character of the uterine contents. The conditions responsible for the bleeding have been divided into benign, functional, malignant and postmenopausal conditions. After discussing these different conditions and their treatment the author says that, although a review of 200 cases should give a good sampling, relatively atypical proportions were found of (1) minor benign conditions causing abnormal uterine bleeding, (2) more severe benign conditions requiring hysterectomy or irradiation and (3) carcinoma of the uterus. In an average office practice one should encounter a much larger proportion of minor conditions, proportionally fewer cases of fibromyoma and a still smaller proportion of malignant lesions. The authors found 80 cases (40 per cent) of uterine fibromyoma and 27 cases (13 per cent) of carcinoma of the uterus. Uterine bleeding in the presence of fibromyoma is usually successfully treated by hysterectomy if the patient has not reached the age of 40 or 42 years, to preserve ovarian function. Hysterectomy is done at any age if the tumor is larger than a uterus two and half to three months pregnant. Patients who are more than 42 years of age and whose uterus is smaller are given a dose of radium sufficient to bring on the menopause. Aside from exceptional cases, curettage should be performed prior to radium treatment. Radium, when used to control menorrhagia associated with fibromyoma, stopped the excessive bleeding in all but 2 of 17 cases. The results of total hysterectomy for carcinoma of the body of the uterus, with a rate of cure of 63 per cent, appears to justify continuance of this treatment. The rate of cure of 37 per cent for carcinoma of the cervix following irradiation with radium and x-rays conforms to the usual results. The curability of early carcinomatous lesions is much greater than the curability of the more advanced. In a large majority of cases the warning sign of abnormal uterine bleeding was ignored too long.

Minnesota Medicine, St. Paul

27:1-80 (Jan.) 1944

Diagnosis of Glaucoma. A. G. Athens.—p. 21.
Epidemic Keratoconjunctivitis. K. C. Wold.—p. 25.
Foreign Bodies Lodged in Air or Food Passages. K. A. Phelps.—p. 27.
*Recurrent Venous Thrombosis: An Early Complication of Obscure Visceral Carcinoma. T. Cooper and N. W. Barker.—p. 31.

Venous Thrombosis in Obscure Visceral Carcinoma.—Cooper and Barker point out that the spontaneous development of thromboses in the peripheral veins may be a definite presumptive sign of the presence of obscure visceral carcinoma. They describe 4 cases to illustrate the connection between visceral carcinoma and peripheral thrombophlebitis. They conclude that: 1. Visceral carcinoma is often the predisposing factor in the development of multiple, and sometimes distant, venous thrombosis. This seems particularly true in cases in which the neoplasm arises from or involves the body or tail of the pancreas. 2. In the absence of other obvious causative factors, the development of apparently spontaneous peripheral thrombophlebitis when the patient is 50 years or more or age should suggest a careful search for visceral carcinoma. 3. The formation of a thrombus in many of these instances would appear to be the result of more than simple mechanical obstruction, circulatory stasis or alteration in the structure of the vessel wall. Further study of the factors influencing the coagulation of the blood would seem indicated.

New York State Journal of Medicine, New York

44:113-224 (Jan. 15) 1944

Degree, Extent and Mechanism of Muscle Spasm in Infantile Paralysis. H. D. Bouman and R. P. Schwartz.—p. 147.
Artificial Insemination Aided by Use of Vaginal Diaphragm. B. A. Kornblith.—p. 154.
Fever as Adjuvant to Specific Therapy in Syphilis. E. W. Thomas.—p. 157.
Vitamin Aid in Treatment of Colds: Preliminary Report. C. Ward Crampton.—p. 162.
Sudden Death from Infection and Neoplasm. T. J. Curphey.—p. 167.
Incidence of Deficiency Syndromes. H. T. Kelly and Myrtle Sheppard.—p. 172.
Contribution of Modern Psychiatry to Physician and Surgeon. S. Blanton.—p. 177.
Pneumonology. M. S. Lloyd.—p. 180.
Anesthetic Management of Aged Patients with Fractured Neck of Femur. S. G. Hershey and Evelyn Apogi.—p. 183.

Northwest Medicine, Seattle

43:1-30 (Jan.) 1944

Principles of Treatment in Peripheral Nerve Injuries. M. T. Schnitker.—p. 5.
Filariasis. E. C. Faust.—p. 9.
Tumors of Spleen. S. F. Herrmann.—p. 14.
Plastic, Molded Contact Lenses. W. N. Moray Girling.—p. 17.
Contact Dermatitis From Use of Lacquer on Hair. T. S. Saunders.—p. 19.

Physiological Reviews, Baltimore

24:1-168 (Jan.) 1944

Functional Organization of Spinal Cord. D. P. C. Lloyd.—p. 1.
Obesity: I. Energy Metabolism. L. H. Newburgh.—p. 18.
Id.: II. Etiologic Aspects. J. W. Conn.—p. 31.
Cellular Composition of Normal Bone Marrow as Obtained by Sternal Puncture. E. E. Osgood and A. J. Seaman.—p. 46.
Chemical Method for Determination of Death by Drowning. A. R. Moritz.—p. 70.
Role of Adrenal Cortex in Physiologic Processes. W. W. Swingle and J. W. Remington.—p. 89.
Lipotrophic Factors. E. W. McHenry and J. M. Patterson.—p. 128.

Public Health Reports, Washington, D. C.

59:1-32 (Jan. 7) 1944

National Inventory of Needs for Sanitation Facilities: I. Public Water Supply. H. W. Streeter and R. Raneri.—p. 1.

59:33-64 (Jan. 14) 1944

Illness from Cancer in United States. H. F. Dorn.—p. 33.
Lesions in Rats Given Sulfathiazole, Sulfadiazine, Sulfanilamide, Sulfamerazine, Sulfapyrazine or Acetylsulfadiazine in Purified Diets. K. M. Endicott, A. Kornberg and F. S. Daft.—p. 49.

Southwestern Medicine, Phoenix, Ariz.

27:297-314 (Dec.) 1943

Years of an Editor. M. P. Spearman.—p. 297.
Maternal Deaths in Arizona During 1942. H. C. James.—p. 298.
Banti's Disease: Apparent Recovery of Case. A. E. Clark.—p. 299.
Abdominal Pregnancy. P. H. Loveless and C. P. Austin.—p. 301.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Indian Medical Gazette, Calcutta

78:527-574 (Nov.) 1943

*Phenomenon of Autoagglutination in Man After Sulfapyridine. J. G. Parekh.—p. 527.
War Injuries of Eye: Localization and Removal of Magnetic Intraocular Foreign Bodies. E. O'G. Kirwan and M. Sen Gupta.—p. 530.
*Report on Tropical Ulcers. D. R. Bharucha.—p. 532.
Sulfonamides in Undulant Fever. P. N. Bardhan.—p. 535.
Observations on Neuropathic Sequel of Diamidinostilbene Therapy in Kala-Azar. P. C. Sen Gupta.—p. 537.
Mental Symptoms in Pellagra and Nicotinic Acid Deficiency. L. P. Varma.—p. 543.
Preliminary Observations on Use of Rauwolfia Serpentina Benth. in Treatment of Mental Disorders. J. C. Gupta, A. K. Deb and B. S. Kahali.—p. 547.
Sulfapyridine Anuria. R. E. Waterston and C. C. B. Doherty.—p. 549.

Autoagglutination After Sulfapyridine.—According to Parekh, agglutination of a person's red corpuscles by his own plasma or serum is rare. Nevertheless, in human beings this phenomenon has been observed in chronic mitral endocarditis with bronchopneumonia, during convalescence from pneumonia, in trypanosomiasis, in cirrhosis of the liver, in relapsing fever, in syphilis, in epilepsy, in certain forms of icterus due to hemolysis, in secondary anemia, in pernicious anemia after sulfanilamide administration and in snake poisoning. The author reports the history of a man aged 35 in whom autohemagglutination followed the administration of sulfapyridine for a respiratory infection. The agglutination was most noticeable in the cold and was feeble or inactive at 37 C. The process of autoagglutination is reversible.

Tropical Ulcers.—Bharucha reports a series of 179 cases of cutaneous ulcer. His aim was to investigate the cause and to shorten the period of hospitalization. Poor diet, especially one deficient in proteins, calcium and vitamins B and C, also excessive humidity and excessive rainfall, specific organisms such as fusiform bacilli and a high incidence of syphilis have each in turn been labeled as the cause of these ulcers. Weighing all the evidence at his disposal, the author concludes that these so-called tropical ulcers are not caused by a specific organism. He concludes that they started as small injuries which were neglected and became septic. Many of these soldiers after the receipt of minor injuries continued to take part in the training schemes, and they had to continue wearing boots and puttees and had few opportunities for cleaning the injured part or keeping it at rest. He suggests that every soldier who receives any injury, however trivial, should have an opportunity to get the wound cleaned and dressed at the earliest possible moment and be exempt from such duties as involve the constant use of the injured part till healing is complete. Force is added to this suggestion when it is seen that these 179 patients spent in all 6,056 days in the hospital. This does not include the time before admission to the hospital during which they were not fit to work and the time spent by many of them at the convalescent depot.

Journal of Royal Army Medical Corps, London

81:255-306 (Dec.) 1943

*Diagnosis and Treatment of Yaws Among West African Troops. W. H. H. J. De Wytt.—p. 255.
Control of Malaria: East Africa Command, 1940-1943. D. B. Wilson and A. R. Melville.—p. 263.
Common Anorectal Conditions in Army. H. S. Shucksmith.—p. 269.
Management of Lung Disease of Uncertain Diagnosis. T. Lee—p. 278.

Treatment of Yaws.—De Wytt analyzes 72 cases of yaws. A table which classifies the cases shows that with the exception of 2 cases of primary yaws all other cases were tertiary. The salient feature of this series is the large proportion of foot yaws, which accounted for 66 per cent of the total. In 33 of the 43 cases of foot yaws a history of intermittent disability with exacerbations during the rainy season was obtained. The diagnosis was based on the presence of "pitting," the hypertrophic epithelium, the history of exacerbation during the rains and the positive Kahn test. Neoarsphenamine and sodium potassium bismuthyl tartrate were used in the treatment. In all 9 cases were treated with neoarsphenamine, the course consisting of an initial dose of 0.45 Gm. followed by weekly doses of 0.6 Gm. up to a total of twelve injections. The remaining cases were treated with intravenous sodium potassium bismuthyl tartrate, the course being twelve weekly injections of 1 grain (0.065 Gm.). The solution used was made in the hospital dispensary with a concentration of 1 grain in 2 cc. of distilled water. The intravenous route was preferred to the intramuscular, as the latter can be very painful and may render the patient temporarily incapable of full duties. Since the exhibition of sodium potassium bismuthyl tartrate may produce renal damage, the urine was tested twenty-four hours after each injection. Persistent albuminuria in 3 cases cleared up after the treatment was changed to neoarsphenamine. Clinical cure was obtained in all 72 cases. The author points out that the treatment recommended by most workers for yaws in adults is three injections of one of the arsenical or bismuth preparations. Many do not seem to realize that, although there is about 50 per cent of cures with this dosage, there is also a high relapse rate. The blood reaction in yaws is known to be very unresponsive to treatment, and it seems reasonable to suppose that this is because the treatment is not carried out for a long enough period. A similar state of affairs obtained in the early days of the arsenical treatment of syphilis, when apparent cure after a few injections was followed later by a recurrence of the disease. It is now known that the treatment of syphilis must be continued until the blood reaction is negative, and it is probable that the same thing is true of yaws.

Archivos Americanos de Medicina, Buenos Aires

19:67-82 (Nov. 1) 1943. **Partial Index**

*General Telangiectasis Angioma. E. Martinez Zuviría and I. Naput.—p. 68.
Required Conditions for Normal Feeding: Diet in Dermatosis in Children. B. Soria.—p. 74.

Multiple Telangiectasis Angioma.—Martínez Zuviría and Naput's patient presented, at birth, multiple telangiectasis angioma which covered the entire surface of the body, including the palms of the hands, soles of the feet and the scalp. Frequent hemorrhages occurred as the result of rupture of the angiomas. The clinical diagnosis of telangiectasis angioma was confirmed by the results of a biopsy. The tests for syphilis in the parents and in the infant gave negative results. During the first four months of the patient's life the angiomas increased in number and size. A hydrocele appeared. The therapy consisted in acetylarsan administration followed by ultraviolet irradiations. The hydrocele was reabsorbed. The angiomas slowly disappeared and the skin became normal within ten months. This is the first case of multiple telangiectasis angioma with entire disappearance from the skin which has been reported in the literature.

Revista Argentina de Cardiología, Buenos Aires

10:145-222 (July-Aug.) 1943. **Partial Index**

*Apex Beat in Mitral Stenosis. P. Cossio.—p. 145.

Apex Beat in Mitral Stenosis.—Cossio carried on simultaneous records of the apex beat and of the heart sounds in 10 normal persons, 10 patients with mitral stenosis and 20 patients with various heart diseases (arterial hypertension, auricular fibrillation and nodal rhythm). Two different movements can be distinguished in the early systolic part of the apex beat record, namely a slow beat which is due to initiation of the ventricular systole and a rapid vibrating impact which is due to the systolic tension of the auriculoventricular valves during occurrence of the first heart sound. In normal conditions beat and impact are synchronous, whereas in mitral stenosis the slow beat precedes the rapid vibrating impact. This phenomenon is of almost pathognomonic value. It can also be perceived by palpation. It is attributable to the retarded closure and tension of the mitral valve (first sound) due to the low initial tension of the mitral valve at the beginning of the systole, which is caused by the hemodynamic conditions which exist in mitral stenosis.

Book Notices

Applied Dietetics: The Planning and Teaching of Normal and Therapeutic Diets. By Frances Stern, Chief of Frances Stern Food Clinic, The Boston Dispensary, Boston. Second edition. Cloth. Price, $4. Pp. 265. Baltimore: Williams & Wilkins Company, 1943.

This edition of a standard manual is based on the methods developed in the Food Clinic of the Boston Dispensary. The first edition was dated 1937. The new edition uses the same mode of presentation as the first but includes the results of later research in nutrition and its application in modern dietetic practice. Most of the information is presented in tabular form. There are fifty-seven tables. These tables present the information about foods and diets from various points of view. Beginning on page 210 and extending through page 255 is a series of tables beginning with summaries of the normal diet in terms of meals for the day for the adult and the child, followed by similar tables for allergic persons, those with spastic constipation, colitis, ulcers, underweight, overweight, diabetes, liver disease, ketogenic diets, nephritis, pregnancy and tables showing typical normal diets and the variations for abnormal conditions. These tables would be more useful if they were numbered. The book includes dietary outlines for the management of normal diets, food allergies and other conditions for which tabulations have been listed. A typical outline is that for atonic constipation, which occupies practically two pages and is dealt with under the headings part of body affected, physiology, abnormal conditions, contributing factors, laboratory data, dietetic treatment, food constituents, foods (foods used, as distinguished from the others for special contributions), meals, environmental factors that influence the effectiveness of the diet, education of the patient, abnormal conditions and diseases that may be found in association with atonic constipation. There is a long series of tables to assist in simpler computation of the diet. These tables are numbered. There is an excellent chapter on the education of the patient on the normal diet.

This book should be invaluable in any hospital dietary department, in the teaching of dietetics to nurses, in the training of dietitians, and as a reference book for physicians in whose work dietary factors are important.

The Boy Sex Offender and His Later Career. By Lewis J. Doshay, M.D., Ph.D., Psychiatrist, Children's Courts, New York City. Foreword by George W. Henry, M.D., Associate Professor of Clinical Psychiatry, Cornell University Medical College, New York. Cloth. Price, $3.50. Pp. 206, with 12 illustrations. New York: Grune & Stratton, 1943.

Dr. Doshay is an experienced psychiatrist and has worked with juveniles for a considerable period. Most of this present study deals with 256 juvenile sex offenders who have all appeared in court clinics of New York during a six year period. This is an adequate sample because of the small number of juvenile sex offenders that come through the court. The report covers a six year period of study and tends to cover every aspect of the history of the environmental contacts, including parental attitudes. Such factors as nationality of parents, status of the home and sibling relationships are touched on, but friction between the parents is also covered in certain aspects. Other types of factors to which attention is given are community factors, including the neighborhood, recreational and school facilities. The second part of the book deals with the personality of the sex delinquent, including what the author calls "inherent traits," which are age, race, intelligence quotient, disorders of the mind and bodily disorders of temperament, and some attention is given to what the court has done with juvenile offenders. The author concludes with a discussion of adult successes and failures. There are two concluding chapters, one in which the author gives the derived conclusions with a list of twelve questions such as "Do the findings of the study warrant the transfer of management and treatment of juvenile sex offenders from the courts to the community agencies?" The answer to this question is that the question will find answer in the next chapter. The final chapter deals with predicting treatment and prevention. Probably the most important conclusion to which the author comes, based on his mass of statistical material, is that the juvenile sex delinquent boy seems to be self curing. This is an important conclusion. The court clinic in Detroit has pointed this out again and again, but Doshay's findings, based on juveniles including six years of careful follow-up, stresses this important fact. Much of the statistical material that Doshay prints is not worthy of the attention he gives it. The figures and tests of validity are not applicable to those statistics. Some of the distributions are spread so thin that no conclusions can be drawn from them. All in all, however, this very careful and well written survey gives a general impression about the male juvenile sex offender which those having to do with such cases should find interesting.

A Practice of Orthopædic Surgery. By T. P. McMurray, M.B., M.Ch., F.R.C.S., Professor of Orthopædic Surgery, Liverpool University. Second edition. Cloth. Price, $7. Pp. 435, with 191 illustrations. Baltimore: William Wood & Company, 1943.

The author's objective is the instruction of young surgeons and final year students in the basic principles of orthopedic surgery. He has adhered to unadulterated orthodox practice. The section on the knee reflects the opinion of a recognized authority with an extensive training and experience. The McMurray test has been found helpful in the diagnosis of many cases of internal derangements of the knee. Much can be learned from a carefully taken history of the injury. The occurrence of pain and its exact site are of importance, and the joint must be carefully palpated to localize any area of tenderness. The stability of the lateral and crucial ligaments must be tested and the full range of painless movement carefully measured. The whole surface of the joint should be palpated while the patient bends and straightens it through its fullest possible range. Radiographic examination of the joint in at least two planes at right angles to each other is of the greatest help.

If in spite of the most careful routine examination the diagnosis is still in doubt, various accessory methods can be employed, of which the following has proved itself to be the most reliable: This method of examination by manipulation is of particular value in those injuries to the cartilage in which the lesion involves the meniscus at or behind the middle of the joint. Lesions of the cartilage in this region do not give rise to the classic syndrome of "locking" and "unlocking" because any reduplication of the broken portion of the cartilage produces a block to flexion rather than to extension of the joint. When the test is correctly applied, not only can the presence of a lesion be determined but its exact site can be mapped out with comparative certainty. During the examination the patient must be recumbent and relaxed; the surgeon, standing on the side of the injured limb, grasps the foot firmly, while the knee is bent to its fullest possible range until the heel approaches or touches the buttock. The foot is now rotated externally and the leg adducted at the knee. With the leg and foot at this angle, the knee is slowly extended. With the alteration of the angle of the joint, any loose portion of the internal cartilage is caught between the articular surface of the femur and tibia, and the sliding of the femur over the abnormal portion of the cartilage is accompanied by an appreciable click and pain, which the patient states is the same that he has already experienced when the knee gave way. The examination should be completed by a similar extension of the knee from full flexion while the foot is rotated inward and the leg adducted. If no click can be produced by these movements properly conducted, it may be safely considered that the internal cartilage is normal posteriorly. If a click is produced it is possible to determine, from its severity and the angle of the joint at the time of its occurrence, the size of the broken portion of the cartilage and its site in the cartilage substance.

Occasionally when the patient is particularly nervous the examination cannot be properly completed without the help of general anesthesia.

Health for the Having: A Handbook for Physical Fitness. By William R. P. Emerson, A.B., M.D., Professor of Pediatrics, Tufts College Medical School, Boston. Cloth. Price, $1.75. Pp. 146. New York: Macmillan Company, 1944.

The title of this book promises more than the book delivers. The health problem is not so simple that one can speak justifiably of "health for the having." Especially is this true when it develops that the book is built on ideas which were current in health education immediately after the first world war. There

was an era in which writers in the health field evolved rules of living. No two sets of rules were alike. The result was needless confusion and complete disillusionment with health education on the part of many individuals, lay and professional alike. Many criticisms could be made of this book particularly with respect to the handling of the portions relating to nutrition, which are definitely inadequate. Chapter XI deals with budgeting time for a theoretically satisfactory day. According to the schedule offered there must be no variation in rising time, meal time, morning exercise, morning bath, cold bath, air bath, breakfast, morning constitutional and so on throughout the day. No one living according to the prescribed ritual would have time to think about anything else but health, and certainly there would be little of interest in living such a life. There is overemphasis on the cold bath. Few physicians would seriously advise their patients when they awaken between 5 and 7 in the morning—if they do—to get up for a glass of water possibly taken hot or with lemon juice.

The most serious criticism, however, must be of the statement on page 122 "With only moderate fidelity to four easy rules, new funds of energy can be released, most cases of indigestion banished, blood pressure reduced and the major part of all sickness prevented. I have seen this happen in hundreds of cases where chronic fatigue, malnutrition and nervous irritability were threatening the very existence of an individual."

The rules to which reference is made are summarized in the sentence "If there ever was a golden cure-all, here it is: fresh air and sunlight, proper food and eating habits, regular exercise, adequate rest. Despite all the marvels of medical science there are no other approaches to health." This definitely takes in far too much territory.

While the book contains much useful material, it is so narrow in its approach that it cannot be recommended.

Old Age in New York City: An Analysis of Some Problems of the Aged, Based on 3,106 Requests for Information About Health and Welfare Services. By Helen Hardy Brunot. Prepared from Records of the Bureau for the Aged of the Welfare Council of New York City. Paper. Price, $1.50. Pp. 128. New York: Welfare Council of New York City, 1944.

The Bureau for the Aged of the Welfare Council of New York City analyzed the information concerning 1,935 applications to the bureau during two and one-half years beginning May 1, 1939 as the basis of this study. Old age is not a single simple condition but a climax of many complications, physical, mental, economical, personal and social.

The total population of New York City increased only 7.6 per cent in the decade following 1930, but the number of persons aged 65 and over increased 56.7 per cent. Possibly this disproportion in growth is in part responsible for the fact that provisions for the aged were found so highly deficient. Waiting lists of homes for the aged were so long that applicants were often required to wait years at a period when life expectancy is short. The problems not only of the 58.1 per cent who were financially dependent but also of those whose resources or working capacity rendered them "self sustaining" were many and complex. Employment in ordinary times was difficult to obtain, although the general desire of the aged to continue at work is shown by the report of the Social Security Board, Sept. 3, 1942, that of 825,000 eligible for old age pensions 585,000 had deferred their applications to remain at work. Although New York offers exceptional provisions for medical care for the aged, the lack of accommodations for the chronically ill and the peculiar conditions of sickness in the aged left much to be desired.

Tuberculosis, Labor and Management: A Guide to Industrial Relations. Prepared by William Arkwright Doppler, Ph.D., Director, Industrial Relations, National Tuberculosis Association. Paper. Pp. 52. New York: National Tuberculosis Association, 1944.

Because tuberculosis is most prevalent in the wage earning class, it is an industrial health problem and can be met better by cooperation of management, employees and physicians than by charity or governmental regimentation. Case finding by universal x-raying is the first step. This pamphlet is a practical guide to the ways in which this beginning can be made. It tells how to approach management, unions, the public, governmental agencies involved and the medical profession to secure acceptance. Recent changes in industrial medicine, of which the contribution of the Council on Industrial Health of the American Medical Association is noted, and the spread of collective bargaining, with greater recognition of the need of health measures by organized labor, have helped to smooth the way for tuberculosis surveys. Estimates of the cost of such surveys are given, the relation to workmen's compensation explained and a program of conducting surveys set forth, all accompanied by references to the sources of further information. The result is a helpful, practical guide for any worker in this field.

Pancreatitis aguda: Etiologia—patogenia. Por Wenceslao Tejerina Fotheringham, profesor de patologia quirúrgica de la Facultad de medicina de Rosario. (Relato oficial al XIV Congreso argentino de cirugía). Paper. Pp. 138, with 51 illustrations. Buenos Aires: "El Ateneo," 1942.

An excellent monograph on the etiology, pathogenesis and evolution of acute pancreatitis. What is classically known on the disease is well analyzed, and the experimental contributions of the author to the subject are numerous and well conducted. It is emphasized that the fundamental lesion is pancreatic necrosis. It has been postulated that this lesion can be produced by mechanical agents, circulatory and neurovascular causes, effect of bile and autodigestion. The author is inclined to think that all these actions precede or follow the fundamental cause, infection, while he considers that hypersensitiveness as a cause of acute pancreatitis in man has not been sufficiently proved. The illustrations are reproductions of photographs of gross and microscopic specimens. The index contains 219 references.

Health Education on the Industrial Front: The 1942 Health Education Conference of The New York Academy of Medicine. Cloth. Price, $1.25. Pp. 63. New York: Columbia University Press, 1943.

The title of this book leads one to believe that methods of health education on the industrial front might be detailed or discussed by the contributors. Such, however, is not the case except for the material given on the subject "Control of Accidents." The contributors are all well known men, some industrially, some nonindustrially, and have presented material on food and nutrition, wartime industrialization, disease and handicap detection and control in industry, and mental problems and morale in industry. None of the persons selected to give addresses were specialists on health education in industry, although what they did give is valuable information on the subjects mentioned.

Fisiopatologia y neurobiologia de la epilepsia producida por cardiazol. Por Carlos Gutierrez-Noriega. Tesis doctoral, Facultad de ciencias médicas de Lima. Paper. Pp. 60, with 2 illustrations. Lima, 1940.

As the author himself points out in the introduction of this thesis, his work on the subject is in many aspects just a duplication of what was done by others, but in other aspects Gutierrez-Noriega's contributions are original, and this monograph should be read by workers interested in the physiopathology of epilepsy. The most important conclusion is that which establishes a strict parallelism between the phylogenic development of locomotion and epilepsy and that of the instinctive tendencies, so that the nervous centers involved act as agents regulating and equilibrating the dynamics of the total nervous system. A list of 76 references is appended, of which 16 are previous contributions by the author.

The 1943 Year Book of Industrial and Orthopedic Surgery. Edited by Charles F. Painter, M.D., Orthopedic Surgeon to the Massachusetts Women's Hospital and Beth Israel Hospital, Boston. Fabrikoid. Price, $3. Pp. 440, with 306 illustrations. Chicago: Year Book Publishers, Inc., 1943.

The book is divided into a section on orthopedic surgery and another on industrial medicine and surgery. The first section covers the subjects of fractures and dislocations, arthritis, tuberculosis, osteomyelitis, paralytic conditions, tumors, congenital defects and lesions of the spine, legs and feet. The second section includes problems of organization and the war, absenteeism, fatigue, respiratory diseases, cardiac conditions and specific hazards. Unfortunately the supply of medical literature from European and Asiatic countries has been largely curtailed.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MANAGEMENT OF PRIMARY HYPOGONADISM

To the Editor:—A man aged 30 complains of an infantile penis. The penis is about 1 inch in length and the circumference is of infantile character. The testes are both present in the scrotum and, although they are smaller than the average, they seem normal otherwise. The prostate is small. The skin is smooth and feminine in appearance. There is no hair on the face or body except for scanty axillary hair and scanty pubic hair of female distribution. The hair of the head is luxuriant and of fine silky character. The hips are wider than the shoulders, and a pelvic girdle of fat is present. The physical examination is essentially normal otherwise except for an exceptionally small neck. A basal metabolic test has not been made. The voice is of adolescent type. The patient has never had a normal sex relation but does have erections and ejaculations on masturbation. He shows no abnormalities in sex behavior except for masturbation. The patient is well adjusted in society. I should like to know of what benefit testosterone, the anterior pituitary gonad stimulating factor and the chorionic gonad stimulating factor would be in increasing the size of the penis and in developing male characteristics. An outline plan of treatment would be appreciated.

Lloyd D. Miller, M.D., Knoxville, Tenn.

ANSWER.—The clinical picture described corresponds well to that of primary hypogonadism. This condition is best treated at present by parenteral administration of testosterone propionate or methyltestosterone orally. Gonadotropins which act by stimulating the formation of androgens are not so consistently effective, for their action depends on an adequate responsiveness of the testes which will vary from patient to patient. A daily dose of 20 to 25 mg. of testosterone propionate injected intramuscularly, or 70 to 100 mg. of methyltestosterone by the oral route, provides pronounced and rapid masculinization, as well as disappearance of many of the phenomena characteristic of testicular insufficiency. In the great majority of such cases after a few weeks of treatment there occurs a distinct increase in size of penis and prostate, development of the masculine pattern of sexual hair, deepening of the voice, enhancement of the erectile ability and increased frequency of erections. Growth of the beard is, as a rule, insignificant even after prolonged therapy; additional effects of testosterone treatment are muscular development, gain in weight and a general sense of well-being. As testosterone is a replacement therapy it should be continued indefinitely. There is no evidence at hand to indicate that the results of therapy will persist on discontinuation of testosterone. A practical procedure would be to alternate three or four months period of administration and rest. The androgens mentioned do not stand accepted by the Council on Pharmacy and Chemistry as yet.

GASTROINTESTINAL HEMORRHAGE

To the Editor:—A physician aged 37 had intestinal hemorrhages in January 1935, September 1935, May 1936, March 1942 and May 1943. On each occasion the hemorrhage has been dark red. (A tarry color appeared only several days after the initial hemorrhage.) The amount of bleeding varied from one which produced no other symptoms to an amount in 1943 sufficiently large to cause reduction of hemoglobin from 90 per cent to 50 per cent and red blood cells from 4,500,000 to 2,500,000. In the intervals between the hemorrhages there have been no other gastrointestinal symptoms. X-ray studies of the stomach and duodenum in 1935, 1936 and 1942 were reported as indicating the presence of a duodenal ulcer. Following the hemorrhage in 1943, x-ray examinations at a well known clinic revealed no pathologic changes in the stomach, duodenum or large bowel. Ascorbic acid levels of the blood and prothrombin clotting time were normal. Gastric acidity was slightly above normal. An abdominal operation was performed with essentially negative findings, except that the terminal ileum was firmly adherent in the right iliac fossa and was freed. (An appendectomy had been performed at the age of 13.) Except for the intestinal hemorrhages, the patient has had no other physical illnesses except for hay fever (allergy to ragweed), which has been present for the last twelve years. My questions are three: 1. What are the diagnostic possibilities in this condition? 2. What further examinations are indicated? 3. What prophylactic treatment can be instituted?

M.D., Illinois.

ANSWER.—1. The diagnostic possibilities in this condition in order of probability are (1) peptic ulcer, probably duodenal, (2) gastric or duodenal erosions, (3) gastric and esophageal varices and (4) peptic ulcer in Meckel's diverticulum. The attacks described are not likely to have been produced by a bleeding lesion in the colon or terminal ileum, although an ulcer of Meckel's diverticulum is possible. The fact that x-ray studies in 1935, 1936 and 1942 were reported as indicating the presence of a duodenal ulcer strongly suggests this diagnosis together with the fact that the physician is only 37 years of age and that such recurrent hemorrhages are common in ulcer. Furthermore, the absence of hematemesis is rather characteristic of a duodenal lesion. The negative x-ray examination in 1943 at a well known clinic and the negative operation do not exclude the diagnosis of duodenal ulcer at all. The other possibilities mentioned, such as erosions and varices, cannot be excluded at present.

2. With regard to further examinations, probably another x-ray study should be suggested first. This examination might be negative in a period of remission and positive shortly after hemorrhage. X-ray examination should also give evidence of varices in the esophagus if these are present. If the examination is negative, gastroscopy would be in order, particularly after hemorrhage.

3. The most conservative prophylactic treatment in such cases is medical ulcer management; if further hemorrhages occur, subtotal gastrectomy is the procedure of choice.

UNUSUAL SKIN LESION SUGGESTING IMPETIGO OR HERPES

To the Editor:—A girl aged 5 years was first seen with a small skin lesion over the left supraorbital notch which had the appearance of a fever blister. At this time there were no other complaints and no treatment was undertaken. Four days later she began to have a fever which varied from 100 to 105 F. Physical examination was entirely negative except for the lesion mentioned, which consisted of a dry yellowish scaling crust about 8 mm. in diameter. The mother said that this had started one week previously as a small pimple. On removal of the crust, which was loosely attached, the underlying skin was slightly pink and weeping, but there was no bleeding, ulceration, induration or erythema. There were apparently no itching pain or other subjective symptoms associated with this lesion. The lesion showed no tendency to spread or enlarge. The surrounding skin, up to the border of the scale or crust, was normal. One small movable, slightly tender lymph node, which gradually enlarged until the size of a lima bean, was present in the left submaxillary region. A gram stained smear of the lesion showed no organisms. Smears of the crust in sodium hydroxide revealed no fungi. The fever persisted for ten days, but the patient did not appear ill. The Kahn test was negative. The red blood cell count and differential count were normal. The white blood cell count on the second and sixth days of fever was 9,500 and 11,650 respectively. Urinalysis was negative. There was also a small lesion on the dorsum of the right second finger which started as a small papule and by the fifth day of the fever was a red macule 4 mm. in diameter, with a vesicular border and a small yellowish crust in the center. Epitrochlear or axillary lymphadenopathy was not present. On the seventh day of fever the patient complained of slight earache. The border of the left drum was slightly injected. One instillation of "auralgan" relieved this. On the eighth day of fever sulfathiazole was given orally, and sulfathiazole ointment was applied to the lesions after removal of the crusts. Urinalysis and blood counts were at this time within normal limits. The temperature returned to normal after two days of treatment, and the patient was apparently cured although the submaxillary gland was still palpable. There was no previous history of unexplained fevers. I can find nothing to correspond with this in our references. Could you suggest any possible diagnosis?

Lieutenant (MC), U. S. N.

ANSWER.—The description of the initial lesion suggests impetigo or herpes simplex. To assume that an impetigo contagiosa consisting of only a single lesion could after seven days cause a febrile reaction accompanied by a second lesion on the hand requiries a considerable stretch of the imagination. Impetigo is known at times to cause nephritis (Sutton, L. E., Jr.: Nephritis Complicating Impetigo, *South. M. J.* **27**:798 [Sept.] 1934. Palmer, H. E.: Impetigo Complicated by Hemorrhagic Nephritis, *J. Florida M. A.* **27**:73 [Aug.] 1940) but only in case of extensive eruption. The failure to find organisms in the smear from an impetigo lesion, even an old one, seems strange. It is perfectly consistent with the diagnosis of herpes simplex, however.

The relation of herpes simplex to febrile disorders is well known. A disease reported by European observers called febris herpeticus (Schönfeld, W.: Zoster and Herpes Simplex, *Handbuch d. Haut- u. Geschlechtskr.*, Berlin, Springer, 1928, 7/1, p. 91) consists of a febrile attack lasting only a few days, followed by herpes simplex. The disease, which is at times epidemic, is thought by some to be a form of meningitis, by others an Escherichia coli infection and by still others a disease *sui generis*. Schönfeld mentions the case reported by Albrecht, which he considered febris herpeticus. Although physical signs were normal over the chest, x-ray examination showed diffuse hilus shadows, which two days later had disappeared.

Schroeder (Chirurgische Beobachtungen zur Herpes Frage, *Deutsche Ztschr. f. Chir.* **195**:339, 1926) has observed a number of cases of herpes simplex after operation not explainable by the outcome of the surgical measures. In some of them he found E. coli in the blood stream; in others the urine, which had been clear at the time of operation, was full of the same organism without any evidence of infection of the urinary tract.

He thinks that the simple passage of these organisms through the urinary tract causes a reaction sufficient to precipitate an attack of herpes.

Some such slight disturbance of health may have brought on the attack of herpes in the case described. A hidden infection may have taken place, causing sufficient disturbance to bring out the herpes but not at the time causing other symptoms. During the following week sensitization to the infecting germ or virus developed, as occurs in so many diseases, and the fever resulted. If the infected area had been in the upper air passages, the extension to the ear drum and submaxillary gland could easily have occurred. The second skin lesion, on the finger, may have been a second herpes lesion or a complicating impetigo cut short by the ointment.

RECURRENT BLOODY PLEURAL FLUID WITH REPEATED ESCAPE AND REABSORPTION IN CHEST WALL

To the Editor:—A woman aged 54 has had a chronic cough for several years. There is no history of tuberculosis. She has had vague digestive trouble for six months and has lost 20 pounds (9 Kg.). She has a pigmented mole measuring 1 by 2 centimeters over the right ilium. The patient was seen after she had had a sudden severe attack of pain in the right dorsolumbar region. The temperature was 99.5 F. There were no dyspnea, no aggravation of the cough, some pain on deep breathing but more on motion of the back. No abnormalities were discovered in the lung. My diagnosis was lumbago. I made a third visit nine days later and found the right side of the chest full of fluid and the patient had considerable mechanical difficulty with respiration. She was tapped of 1,500 cc. of bloody fluid. This fluid gave negative results on culture and smear, negative guinea pig inoculation for tuberculosis and no tumor cells. For two and a half months she was tapped an average of once in four to five days of the same bloody fluid in quantity from 500 to 2,500 cc. Indication for tapping was increasing dyspnea. Eighty days after onset I received an urgent call to tap the fluid. However, when I arrived she was improved and I discovered that the right breast was full of fluid and this swelling rapidly spread into the axilla and down as far as the crest of the ilium. Since that time she has not been tapped again but undergoes the following sequence of events: The fluid gradually absorbs, the dyspnea increases until it is quite severe, she has a coughing spell, the fluid again fills the subcutaneous tissues and the dyspnea is relieved. Prior to this dramatic change in events the patient was rapidly failing but since then, since she no longer loses this large amount of nourishment, she has been gradually improving and is now in good condition except that the chest is full of fluid and she is unable to sit up or lie on the left side. Her appetite is excellent, digestion is good and she has no complaint except dyspnea when the chest fills. She has never been able to sit up for x-ray examination, and the films show only a chest full of fluid. Physical examination at present reveals the entire chest flat to percussion; the heart and mediastinum are shoved over, depending on the amount of fluid; the heart irregular, sounds are clear and the rate is moderate; there are no tumors in the abdomen; vaginal examination is negative; reflexes are normal; the Kahn test for syphilis is negative. The pigmented mole shows no sign of activity. Temperature is normal. My first diagnosis was cancer of the lung or pleura. However, it is now eight months since the onset, and the improvement in the patient's condition now makes me doubt that diagnosis. The sudden onset suggests embolism, but I have been able to discover no source of a possible embolism. Might such a condition be caused by an aseptic infarct of the lung? The fluid is strongly blood tinged, in fact quite opaque.

Escape of chest fluid in this way must be unusual. Presumably it escapes through the multiple puncture holes or a tumor is invading the chest wall. **C. H. Holleman, M.D., Watsonville, Calif.**

ANSWER.—The case described is certainly unusual. When one encounters bloody fluid in the pleural cavity one thinks of three things: tumor, which accounts for probably 90 per cent of cases; tuberculosis, which accounts for an occasional case, and infarct, which accounts for a few cases. The fact that the patient is improving after eight months is against tumor. Infarct usually clears rapidly and the fluid absorbs in a few weeks. Negative smears and guinea pig inoculations do not absolutely rule out tuberculosis.

Spontaneous drainage into the tissues of the chest wall is rare in aseptic effusions. The repeated spontaneous drainage of the kind described here is difficult to understand. Ordinarily the tissue spaces become indurated and scarred and fail to absorb fluid after the first few weeks.

The indications appear to be to aspirate the fluid more rapidly than it reforms and eventually rid the pleural cavity of all fluid. This could be done over the course of a few days. Some air might be reinjected to prevent too great change in the pleural pressure. An x-ray film could then be taken with the patient in the sitting position. The fact that the patient's mediastinum is pushed far to the opposite side is a definite indication for more complete and frequent aspiration.

No patient should be considered too ill to have an x-ray film in the sitting position. In cases of this kind it is frequently extremely difficult to make a certain diagnosis. As long as the patient is afebrile and the fluid is sterile the only treatment indicated, whatever the condition, is repeated aspiration and rest. If this is done one can be sure that one is not missing any therapeutic opportunities. The uncertainty in diagnosis is bothersome but sometimes has to be faced. Note should be made of the fact that amebic liver abscesses occasionally break through into the pleural cavity and produce thick bloody fluid. In these cases septic fever is constant.

DIGITALIS FOR PATIENT WITH HEART BLOCK AND DECOMPENSATION

To the Editor:—Following physical and emotional strain due to the hurricane of 1938 a seventy-six year old man has been the subject of complete heart block. For the past three months he has been decompensated as evidenced by dyspnea, orthopnea, pulmonary congestion and dependent edema of the lower extremities. For the past three weeks he has been under my care. Prior to that time he was not only advised, but warned, never to take digitalis. I personally feel that with decompensated complete heart block he should be taking digitalis. For the past three weeks his pulse rate has been 36 to 39. Blood pressure is 180/80. He is now receiving 1.5 cc. of mercupurin intravenously twice a week and this has relieved his pulmonary congestion considerably, but not his dependent edema. Fluids and salt have been restricted. Should digitalis be used in this case and, if so, what would be the dangers attending its use, how would one avoid overdosage without being able to note changes in pulse rate, would periodic electrocardiographic checkups be necessary? **Edward Gliserman, M.D., Niantic, Connecticut.**

ANSWER.—The presence of complete heart block without Adams-Stokes attacks is not a contraindication to the use of digitalis when it is needed in the treatment of congestive heart failure, as it is in the case described. In the past, all sorts of other contraindications to the use of digitalis have also been held and one by one dispelled. These have included hypertension, aortic regurgitation and alternation of the pulse.

There should be no variation from the usual method of digitalization except for a little closer watch of pulse rate and symptoms. Although it is possible to depress the ventricular pacemaker to a low level by digitalis, this does not usually happen. It is persons with partial auriculoventricular block and Adams-Stokes attacks who must be watched particularly, rather than those with well established complete heart block. Occasional electrocardiograms are, however, desirable, although not absolutely essential, preferably three, namely just prior to digitalization, toward the end of digitalization and a few weeks later.

REACTIONS FROM AMINOPHYLLINE INTRAVENOUSLY

To the Editor:—Susan C. Dees of Duke University (*J. Allergy* 14:492, 1943) mentioned any degree of right sided cardiac failure as a contraindication to intravenous use of aminophylline, reactions having been caused by its use. Could you explain why such is the case and its possible mechanism? **Lawrence H. Hoffman, M.D., San Francisco.**

ANSWER.—The reason that right sided cardiac failure represents a contraindication to intravenously administered aminophylline is not clear, since the drug has been widely employed, both orally and intravenously, as a diuretic in congestive heart failure. A detailed report of these reactions, of which several were fatal, is being prepared by Dr. James Hendrix and may be expected to help explain the mechanism.

Severe and occasionally fatal reactions have occurred with the use of intravenous aminophylline in other types of heart disease and in uncomplicated asthma. The majority of the fatal cases, however, have been associated with serious heart disease. In these instances the aminophylline was apparently diluted and administered slowly with the usual precautions.

The rapidity of the reaction in some cases with respiratory and cardiac arrest might suggest a central origin.

References:

Merrill, George Adams: Aminophylline Deaths, THE JOURNAL, Dec. 25, 1943, p. 1115.

Dees, Susan C.: Personal communication.

ANOPHELINE MOSQUITO ONLY VECTOR FOR MALARIA

To the Editor:—Has any work been done in determining the fate of Plasmodium vivax, Plasmodium falciparum or Plasmodium malariae when ingested by any mosquito or insect other than Anopheles? **Captain, M. C., A. U. S.**

ANSWER.—Much work has been done in determining whether mosquitoes other than Anopheline, or various blood sucking insects, could transmit human malaria. In every instance the results have been uniformly negative. As malaria occurs only in association with different species of Anopheline mosquitoes, and since the prevalence of the disease can be definitely correlated with the efficiency or number of Anopheline vectors, it is extremely unlikely that any other species of insects can transmit the disease.